

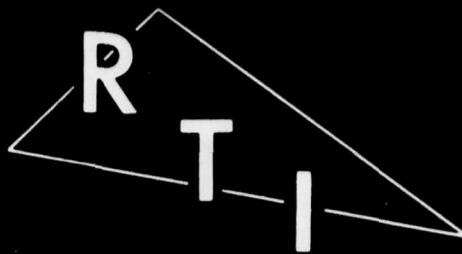
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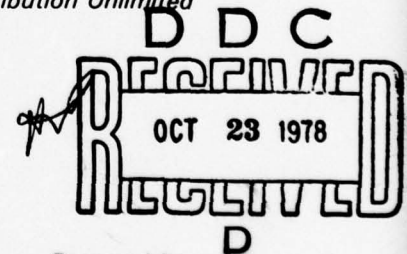
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**STUDY OF CRISIS ADMINISTRATION OF HOSPITAL  
PATIENTS; AND STUDY OF MANAGEMENT OF MEDICAL  
PROBLEMS RESULTING FROM POPULATION RELOCATION**

*Approved for Public Release; Distribution Unlimited*



Prepared for  
DEFENSE CIVIL PREPAREDNESS AGENCY  
Washington, D.C. 20301

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FINAL REPORT RTI/1532/00=04F

September 1978

Study of Crisis Administration of Hospital Patients; and  
Study of Management of Medical Problems Resulting  
from Population Relocation

by

D. R. Johnston, M. N. Laney, R. L. Chessin, and D. G. Warren

for

DEFENSE CIVIL PREPAREDNESS AGENCY

Washington, D.C. 20301

under

Contract No. DCPA01=77=C=0241

DCPA Work Unit 2431H

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## ABSTRACT

This report describes research on crisis administration of hospital patients and management of medical problems resulting from population relocation. About 9.5 percent of risk-area hospital patients are nonrelocatable, i.e., they are either too ill or too severely injured to be moved to a host area. It appears feasible to consolidate nonrelocatable patients into one, or a very few, risk-area hospitals. Alternative plans for consolidation of nonrelocatable patients were evaluated. Evacuation of conventional war casualties from abroad to intra-U.S. hospitals during crisis relocation is expected to increase the numbers of nonrelocatable patients in risk areas, increase the patient load in host areas, and increase the requirement for health services workers to remain in risk areas. Crisis relocation plans should be modified to accomodate war theater casualties. Nursing homes, veterinary clinics and hospitals, and chiropractic, osteopathic and dental facilities (offices) were examined with a view to using them as additional primary care facilities during crisis relocation. Nursing homes, through judicious discharge of residents, can serve as hospitals and veterinary facilities can serve as outpatient clinics. Guidance and a prototype plan were prepared. The Center for Disease Control (CDC) and all state public health laboratories can provide services in support of communicable disease control following a natural disaster and during crisis relocation. Their capability to provide services postattack is questionable. Recommendations for upgrading public health laboratory programs were made. Lacking precedents, the medico-legal implications of emergency medical service and crisis relocation planning interfaces are largely unpredictable. Federal and state legislation addressing problems that can be anticipated now is needed. A checklist of medico-legal questions was prepared.

## TABLE OF CONTENTS

	<u>Page</u>
Abstract . . . . .	ii
List of Tables . . . . .	xii
List of Figures . . . . .	xv

### I. INTRODUCTION AND SUMMARY

A. Introduction . . . . .	I-1
B. Problems Associated with the Consolidation of Hospital Patients and Resources . . . . .	I-1
C. Impact of Evacuation of War Theater Casualties on Intra-U.S. Facilities . . . . .	I-5
D. Capabilities of Allied Medical Facilities and Application in Crisis Relocation . . . . .	I-6
E. Capability of the Center for Disease Control and State Counterpart Laboratories to Function in Disaster and Crisis Environments . . . . .	I-7
F. Medico-Legal Implications of Emergency Medical Service and Crisis Relocation Planning Interfaces . . . . .	I-9
References . . . . .	I-10

### II. PROBLEMS ASSOCIATED WITH THE CONSOLIDATION OF RISK-AREA HOSPITAL PATIENTS

A. Introduction . . . . .	II-1
1. Background . . . . .	II-1
2. Objectives . . . . .	II-2
B. Types and Percentages of Nonrelocatable Patients . . . . .	II-2
1. Methods . . . . .	II-2
2. Results . . . . .	II-4
C. Likelihood of One Hospital Serving as a Consolidation Facility . . . . .	II-4
1. Beds Required for Nonrelocatable Patients . . . . .	II-6
2. Other Resources Required for Nonrelocatable Patients . . . . .	II-13
a. Personnel . . . . .	II-13
b. Equipment and Supplies . . . . .	II-19

## TABLE OF CONTENTS (Continued)

	<u>Page</u>
D. Alternative Approaches to Consolidation . . . . .	II-20
1. Evaluation of Alternative Approaches . . . . .	II-21
2. Approaches to the Consolidation of Nonrelocatable Patients in Three Risk Areas . . . . .	II-23
a. Colorado Springs . . . . .	II-23
b. Macon . . . . .	II-24
c. Utica-Rome . . . . .	II-28
3. Testing . . . . .	II-29
Appendix II-A: List of Diagnoses Submitted to Medical Consultants . . . . .	II-33
References . . . . .	II-39

### III. IMPACT OF EVACUATION OF WAR THEATER CASUALTIES ON INTRA-U.S. FACILITIES

A. Introduction . . . . .	III-1
1. Background . . . . .	III-1
2. Objectives . . . . .	III-2
B. Current DoD Medical Concerns . . . . .	III-2
C. Impact on Medical Problems Resulting from Civil Population Relocation . . . . .	III-3
D. Alternate Plans . . . . .	III-5
E. Recommendation . . . . .	III-6
References . . . . .	III-6

### IV. CAPABILITIES OF ALLIED MEDICAL FACILITIES AND APPLICATION IN CRISIS RELOCATION

A. Introduction . . . . .	IV-1
1. Background . . . . .	IV-1
2. Objectives . . . . .	IV-2
B. Facility Characteristics . . . . .	IV-2



# TABLE OF CONTENTS (Continued)

	<u>Page</u>
1. Nursing Homes . . . . .	IV-3
a. Definition . . . . .	IV-3
b. Services Provided . . . . .	IV-4
c. Geographic Distribution . . . . .	IV-15
2. Veterinary Clinics and Hospitals . . . . .	IV-19
a. Definition . . . . .	IV-19
b. Services Provided . . . . .	IV-21
c. Geographic Distribution . . . . .	IV-28
3. Chiropractic Facilities . . . . .	IV-32
a. Definition . . . . .	IV-32
b. Services Provided . . . . .	IV-33
c. Geographic Distribution . . . . .	IV-33
4. Osteopathic Facilities . . . . .	
a. Definition . . . . .	IV-34
b. Services Provided . . . . .	IV-34
c. Geographic Distribution . . . . .	IV-39
5. Dental Facilities . . . . .	IV-43
a. Definition . . . . .	IV-43
b. Services Provided . . . . .	IV-43
c. Geographic Distribution . . . . .	IV-44
C. Application in Crisis Relocation . . . . .	IV-47
1. Health Problems During Crisis Relocation . . . . .	IV-47
2. Application of Allied Medical Facilities to Primary Care . . . . .	IV-48
a. Nursing Homes . . . . .	IV-48
b. Veterinary Clinics and Hospitals . . . . .	IV-50
c. Chiropractic Facilities . . . . .	IV-51
d. Osteopathic Facilities . . . . .	IV-52
e. Dental Facilities . . . . .	IV-53
3. Conclusions . . . . .	IV-54
References . . . . .	IV-57
D. Development of Guidance and Incorporation of Allied Medical Facilities Into Existing Crisis Relocation Plans . . . . .	IV-61
1. Preparation of Guidance and Prototype Plans . . . . .	IV-61
2. Testing and Revisions . . . . .	IV-62



# TABLE OF CONTENTS (Continued)

	<u>Page</u>
E. Appendix 5, Allied Medical Facilities, Health and Medical Guidance for Crisis Relocation Planners . . . . .	IV-63
1. Introduction . . . . .	IV-63
2. Planning Data Sources . . . . .	IV-63
3. Functions . . . . .	IV-64
F. Fremont County Crisis Relocation Plan, Annex D, Health and Medical Service, Appendix 5, Allied Medical Facilities . . . . .	IV-69
1. Introduction . . . . .	IV-69
2. Participating Organizations . . . . .	IV-69
3. Medical Care Facilities . . . . .	IV-71
a. Nursing Homes . . . . .	IV-71
b. Veterinary Hospitals and Clinics . . . . .	IV-71
c. Chiropractic Facilities . . . . .	IV-72
d. Dental Offices . . . . .	IV-72
4. Appendixes 5a through 5d . . . . .	IV-72
V. CAPABILITY OF THE CENTER FOR DISEASE CONTROL AND STATE COUNTERPART LABORATORIES TO FUNCTION IN DISASTER AND CRISIS ENVIRONMENTS	
A. Introduction . . . . .	V-1
1. Background . . . . .	V-1
2. Research Objectives . . . . .	V-4
B. Communicable Diseases . . . . .	V-4
1. Currently Endemic Diseases . . . . .	V-5
2. Diseases of Potential Postattack Significance . . . . .	V-5
3. Diseases of Potential Significance Following Natural Disasters . . . . .	V-11
4. Diseases of Potential Significance During Crisis Relocation . . . . .	V-12
C. Technical Capability of State Public Health Laboratories . . . . .	V-12
1. Required Laboratory Procedures . . . . .	V-12
2. Technical Capability of State Public Health Laboratories . . . . .	V-17
D. Location in Relation to Nuclear Attack Risk Areas . . . . .	V-21
E. Surveillance and Control of Communicable Diseases . . . . .	V-26
1. Surveillance . . . . .	V-26

## TABLE OF CONTENTS (Continued)

	<u>Page</u>
a. Sources of Data . . . . .	V-26
b. Consolidation and Evaluation of Data . . . . .	V-27
c. Dissemination of Information . . . . .	V-27
2. Surveillance in the United States . . . . .	V-27
a. Quarantinable Diseases Covered by International Agreement . . . . .	V-28
b. Weekly Telegraphic Reports of Notifiable Diseases . . . . .	V-28
c. Reports of Epidemics and Unusual Occurrences of Communicable Diseases . . . . .	V-28
d. National Surveillance Programs . . . . .	V-28
e. Weekly Mortality Report from Cities . . . . .	V-28
f. Dissemination . . . . .	V-30
3. Control . . . . .	V-30
F. Current Plans and Procedures for Communicable Disease Control During Emergencies . . . . .	V-33
1. CDC . . . . .	V-33
2. Selected Public Health Laboratories . . . . .	V-35
G. Recommendations for Upgrading Current Programs . . . . .	V-37
References . . . . .	V-41
VI. MEDICO-LEGAL IMPLICATIONS OF EMERGENCY MEDICAL SERVICE AND CRISIS RELOCATION PLANNING INTERFACES	
A. Introduction and Overview . . . . .	VI-1
B. Legal Implications in Planning for Population Relocation . . . . .	VI-2
C. Legal Use of Federally-employed Health Care Providers . . . . .	VI-7
D. Liability for Emergency Medical Care: Good Samaritan Laws . . . . .	VI-12
1. Interrelationship of Law and Ethics . . . . .	VI-12
2. Groundless Fears of Liability . . . . .	VI-14
3. Effect of Good Samaritan Legislation . . . . .	VI-16
4. Limitations on Good Samaritan Laws . . . . .	VI-18
5. Legal Purposes Served by Good Samaritan Laws . . . . .	VI-20
6. Implications for Population Relocation . . . . .	VI-22
7. Model Statute . . . . .	VI-23
E. Liability for Violation of Professional Licensing Laws . . . . .	VI-24

# TABLE OF CONTENTS (Continued)

	<u>Page</u>
F. Special Reporting Obligations for Health Care Providers . . .	VI-29
1. Child Abuse and Neglect . . . . .	VI-30
2. Newborns . . . . .	VI-31
3. Communicable Diseases . . . . .	VI-32
4. Violent Wounds . . . . .	VI-32
5. Criminal Acts . . . . .	VI-33
G. Admission and Discharge of Patients . . . . .	VI-33
1. Admissions . . . . .	VI-33
2. Discharges . . . . .	VI-35
H. New State and Federal Legislation . . . . .	VI-37
I. Checklist of Potential Legal Problems and Issues Involved with Management of Medical Problems in Population Relocation . . . . .	VI-39
Appendix VI-A: Legal Literature on Population Relocation Medical Problems . . . . .	VI-49
Appendix VI-B: Health Occupations Licensed by State . . . . .	VI-55
Appendix VI-C: Illustrative List of Supplementary Tasks of Military Medical Departments . . . . .	VI-59

# LIST OF TABLES

<u>Table</u>	<u>Page</u>
I-1 Types and Percentages of Nonrelocatable Patients in Short-Stay Hospitals . . . . .	I-3
I-2 Number of Risk-Area Hospitals Required to Care for Nonrelocatable Patients During Crisis Relocation . . . . .	I-4
II-1 Types and Percentages of Nonrelocatable Patients in Short-Stay Hospitals . . . . .	II-5
II-2 Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Colorado Springs Risk Area . . . . .	II-7
II-3 Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Macon Risk Area . . . . .	II-7
II-4 Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Utica-Rome Risk Area . . . . .	II-8
II-5 Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Raleigh Risk Area . . . . .	II-8
II-6 Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in San Antonio Risk Area . . . . .	II-9
II-7 Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Washington, D.C. Risk Area . . . . .	II-10
II-8 Nursing Personnel Requirements . . . . .	II-14
II-9 Estimate of Personnel Required to Care for Nonrelocatable Patients . . . . .	II-16
II-10 Staffing Estimates for Penrose Hospital During Crisis Relocation . . . . .	II-25
II-11 Staffing Estimates for Medical Center of Central Georgia During Crisis Relocation . . . . .	II-27
II-12 Staffing Estimates for St. Elizabeth Hospital During Crisis Relocation . . . . .	II-30
II-13 Staffing Estimates for Rome Hospital During Crisis Relocation . . . . .	II-31
IV-1 Number of Nursing and Related Homes and Beds for Selected Years, United States, 1963-1973 . . . . .	IV-5
IV-2 Percent Distribution of Nursing Homes by Bed Capacity, According to Certification Status: United States, 1973-74 . . . . .	IV-11



# LIST OF TABLES (Continued)

<u>Table</u>	<u>Page</u>
IV-3 Number of Nursing Care and Related Homes and Beds: United States, 1971 and 1973 . . . . .	IV-14
IV-4 Percent Distribution of Nursing Care and Related Homes by Bed Capacity, United States, 1973 . . . . .	IV-15
IV-5 Services Provided in Nursing and Related Facilities . . . . .	IV-16
IV-6 Nursing Care and Related Homes and Beds by State and Host Area . . . . .	IV-17
IV-7 Type of Activity of Members of the American Veterinary Medical Association: December, 1974 . . . . .	IV-20
IV-8 Services Provided in Veterinary Hospitals and Clinics . . . . .	IV-28
IV-9 Veterinary Facilities by State and Host Area . . . . .	IV-30
IV-10 Distribution of Active Chiropractors by State and Host Area: April 1974 . . . . .	IV-35
IV-11 Services Provided by Office-Based Osteopaths . . . . .	IV-37
IV-12 Services Provided in Osteopathic Hospitals . . . . .	IV-38
IV-13 Distribution of Active Non-Federal Osteopaths by State and Host Area: 1971 . . . . .	IV-40
IV-14 Distribution of Osteopathic Hospitals by State and Host Area: 1978 . . . . .	IV-42
IV-15 Distribution of Active Civilian Dentists by State and Host Area: December 31, 1973 . . . . .	IV-45
IV-16 Crisis Relocation Functions for Allied Medical Facilities . . . . .	IV-65
V-1 Reported Communicable Disease Cases and Incidence, United States, 1976 . . . . .	V-6
V-2 Communicable Diseases of Potential Postattack and/or Natural Disaster Significance . . . . .	V-9
V-3 Laboratory Diagnostic Procedures for Communicable Diseases of Potential Postattack or Natural Disaster Significance . . . . .	V-13
V-4 Location of CDC Facilities in Relation to Nuclear Attack Risk Areas . . . . .	V-22
V-5 Location of State Public Health Laboratories in Relation to Nuclear Attack Risk Areas . . . . .	V-23
V-6 Diseases Included in the Weekly Telegraphic Report . . . . .	V-29



LIST OF TABLES (Continued)

<u>Table</u>	<u>Page</u>
V-7 Principal Communicable Disease Countermeasures by Mode of Transmission . . . . .	V-32

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
II-1	Number of hospital personnel per patient versus number of patients, general hospitals, U.S., 1970 . . . .	II-18

## I. INTRODUCTION AND SUMMARY

### A. Introduction

This report describes the results of a research project performed under Defense Civil Preparedness Agency (DCPA) Contract No. DCPA01-77-C-0241. The project consisted of five separate tasks related to crisis administration of hospital patients and to management of medical problems resulting from population relocation. The tasks investigated were as follows:

- . Problems associated with the consolidation of risk-area hospital patients and resources,
- . Impact of evacuation of war theater casualties on intra-U.S. facilities,
- . Capabilities of allied medical facilities and their application in crisis relocation,
- . Capability of the Center for Disease Control and state counterpart laboratories to function in disaster and crisis environments, and
- . Medico-legal implications of emergency medical service and crisis relocation planning interfaces.

The research findings are summarized by task in subsequent sections of this chapter. The reader interested in a more detailed account of any of the research tasks should read the appropriate chapter of this report.

### B. Problems Associated with the Consolidation of Hospital Patients and Resources

In an earlier report [Ref. 1] the consolidation of nonrelocatable (to host areas) patients into one or a few risk area hospitals was proposed as a means of reducing the number of health services workers in risk areas during crisis relocation, while continuing to provide care for such patients. This research examined that proposal in greater detail by determining the types and percentages of patients with conditions requiring that they not be moved to host areas, by determining the likelihood of one facility having the necessary

resources to care for such patients, and by proposing consolidation alternatives suitable for a variety of community situations.

The types and percentages of nonrelocatable patients that may be expected at any given time in a "typical" short-stay medical-surgical hospital are given in Table I-1. As would be expected, patients with neoplasms and circulatory, digestive and respiratory conditions, and accident victims account for much of the group of patients to be consolidated. About 9.5 percent of hospital patients will fall into the nonrelocatable category and will, therefore, be candidates for consolidation during crisis relocation.

The likelihood of one facility having the necessary resources for consolidation was studied for six risk areas. It appears that nonrelocatable patients could be consolidated into one hospital each in the Colorado Springs, Colorado; Macon, Georgia; and Raleigh, North Carolina, risk areas. Due to the distances between facilities, it will probably be necessary to use two hospitals for consolidation in the Utica-Rome, New York, risk area. In the San Antonio, Texas, and Washington, D.C., risk areas, two and three to four consolidation facilities will be needed, respectively. The results of this study are summarized in Table I-2 where it can be seen that in all six risk areas the number of hospitals remaining open during crisis relocation can be reduced dramatically through consolidation of nonrelocatable patients.

Consolidation alternatives include:

- . Consolidation of nonrelocatable patients into one (or a few) hospitals providing all required services;
- . Consolidation of nonrelocatable patients into a reduced number of hospitals on the basis of type of condition;
- . Consolidation of nonrelocatable patients into the facility providing the greatest protection, other things being equal;
- . Consolidation of hospital services (e.g., food, laundry, and laboratory), if more than one risk area facility must remain open; and
- . Combinations of the alternatives listed above.



Table I-1. Types and Percentages of Nonrelocatable Patients in Short-Stay Hospitals

Patient Type	Percent of All Patients
Infective Disease	0.1
Neoplasm	1.2
Endocrine, Nutritional, Metabolic Disease	0.1
Blood, Blood-Forming Organ	0.05
Mental Disorder	0.1
Nervous System, Sense Organ	0.2
Circulatory System	2.4
Respiratory Disease	0.8
Digestive System	0.9
Genitourinary	0.4
Pregnancy, Childbirth	0.5
Skin and Subcutaneous Tissue	0.03
Musculoskeletal	0.3
Congenital, Perinatal, Ill-Defined	0.25
Accident, Poisoning	1.7
Newborn	<u>0.5</u>
Total	9.53



Table I-2. Number of Risk-Area Hospitals Required to Care For Nonrelocatable Patients During Crisis Relocation

Risk Area	Hospitals	No. of Beds	Estimated No. of Nonrelocatable Patients	No. of Hospitals Required
Colorado Springs, CO	5	915	87	1
Macon, GA	4	960	91	1
Raleigh, NC	3	837	80	1
San Antonio, TX	11	4,662	443	2
Utica-Rome, NY	5	986	94	1 or 2
Washington, DC	32	10,738	1,020	3 or 4

C. Impact of Evacuation of War Theater Casualties on Intra-U.S. Facilities

Current Department of Defense (DoD) thinking provides for the treatment of war theater casualties in civilian hospitals in the United States in the event that U.S. forces are engaged in a conventional war overseas. In view of DCPA's plans to evacuate risk areas and the possibility that nonrelocatable hospital patients would be consolidated during crisis relocation, it was of interest to assess the likely impact of an influx of war theater casualties on the medical problems resulting from civil population relocation if crisis relocation were to take place while the U.S. was engaged in conventional war outside of the United States.

Assuming that war theater casualties located in civilian hospitals in the U.S. would be treated the same as civilian patients during crisis relocation, relocatable casualties would be moved to host areas along with civilian patients, while nonrelocatable casualties would be consolidated into one or a few risk area hospitals with their civilian counterparts. The impact of war theater casualties on medical problems resulting from civil population relocation is expected to involve:

- . An increased number of nonrelocatable patients in risk areas,
- . An increased number of health services workers required to remain in risk areas to care for the increased patient load, and
- . An increased number of patients relocated to host areas.

Thus, the most likely impact is one of increased numbers of patients, both in risk and host areas.

In order to cope with the increased numbers of patients, plans should provide for:

- . An increased number of nonrelocatable patients to be consolidated in risk area facilities,
- . An increased number of patients to be relocated to host areas,

- . The specialized services required by the nature of battle casualties in the amount needed in the risk area facilities; these services should be considered in selecting a hospital(s) for patient consolidation,
- . Alternate receiving hospitals in host areas to take casualties incoming after crisis relocation has begun, and
- . Additional transport to move convalescing war theater casualties from risk area to host area hospitals.

D. Capabilities of Allied Medical Facilities and Application in Crisis Relocation

It is unlikely that hospitals in most host areas will be adequate to meet the primary care needs of a greatly enlarged population during crisis relocation. Recognizing that problem, this research examined the capabilities of selected allied medical facilities with a view to their use as supplemental primary care facilities during crisis relocation. The allied medical facilities considered were chiropractors', dentists', and osteopaths' offices; nursing homes; and veterinary clinics and hospitals.

Since dentists and osteopaths are primary care providers, it is reasonable to expect that they will continue to serve as such during crisis relocation, the only real change in their activities being in the volume of patients that they see. Accordingly, their offices will not be available as supplemental primary care facilities. Similarly, it is expected that chiropractors will continue to provide primary care. Indeed, with individuals unaccustomed to strenuous physical labor engaged in the development of expedient shelter, a number of strained backs requiring the assistance of a chiropractor may be expected. As with the dentists' and osteopaths' offices, chiropractors' offices are not expected to be available as a supplemental primary care facility. On the other hand, nursing homes may offer the possibility of supplemental inpatient care. Depending on the particular nursing home and the types of patients therein, it may be possible to make some

beds available to serve as a supplement to a hospital by discharging patients to the care of friends and family. By foregoing or, at least, restricting the treatment of animals, veterinary clinics and hospitals can be used as outpatient facilities for the treatment of human patients. In addition, the mobile dispensaries used by veterinarians engaged in large animal practices would seem applicable as mobile outpatient care units.

Guidance to assist the crisis relocation planner in planning for the use of allied medical facilities was prepared, as was an Allied Medical Facility Appendix to the Health and Medical Service Annex to the Fremont County, Colorado, Prototype Crisis Relocation Plan.

E. Capability of the Center for Disease Control and State Counterpart Laboratories to Function in Disaster and Crisis Environments

The overall objective of this research was to ascertain the capability of the Center for Disease Control (CDC) and state counterpart laboratories to function in disaster and crisis environments, including nuclear and natural disasters.

From a purely technical standpoint, CDC and nearly all of the state counterpart laboratories have the capability to provide diagnostic microbiology services for the communicable diseases thought to be potentially significant following a nuclear attack or a natural disaster and during crisis relocation.

In the event of a nuclear attack, direct weapons effects may render many of the laboratories inoperable. Thus, four of CDC's six facilities, including the principal facility in Atlanta, are in areas judged as being at a high risk of direct weapons effects.\* Of the 50 state public health laboratories, 32

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\*As indicated in High-Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D.C.: Defense Civil Preparedness Agency, April 1975.



are located in high-risk areas for direct weapons effects, nine are in areas designated high-risk because both direct weapons effects and radioactive fallout are anticipated, and nine are in low-risk areas.

CDC and the public health laboratories of the states of Colorado, Georgia, New Mexico, and North Carolina (the states visited) routinely provide diagnostic microbiology services in support of communicable disease control following natural disasters. It appears that they are also capable of providing such services during crisis relocation, up until such time as an attack occurs.

At CDC and the four state laboratories, plans for nuclear attack contingencies, where they exist, have not been updated recently and, in general, are not very detailed. Further, the laboratory directors interviewed were not aware of crisis relocation. CDC has designated an alternate operations site in a low-risk area (Lawrenceville, Georgia); the four state laboratories have not.

Recommendations for upgrading current CDC programs in order to assure their capability of controlling communicable diseases in the event of nuclear war are to:

- . Prepare a detailed plan for the use of the Lawrenceville facility.
- . Identify alternate operations sites in low-risk areas for the Anchorage, Chamblee, and Phoenix (locations of CDC laboratories) activities. Prepare plans for the use of the selected alternate sites.
- . Prepare a plan for postattack communicable disease surveillance.

Assuming that the situation at the four laboratories visited is representative of state public health laboratories in general, the following recommendations are made:

- . The 41 state laboratories located in high-risk areas should select alternate operations sites in low-risk areas and prepare plans for staffing and equipping them during crisis relocation.



- . All state laboratories should review their states' crisis relocation plan to determine if the relocated population necessitates changes in laboratory operations.

F. Medico-Legal Implications of Emergency Medical Service and Crisis Relocation Planning Interfaces

The objective of this research task was to identify legal issues that could arise in providing health services during crisis relocation. In the context of this research, emergency medical service means all types of medical services provided during an emergency period and thus includes primary care and public health as well as treatment of medical emergencies.

Laws bearing on this problem area vary considerably from state to state. The medico-legal implications of emergency medical service and crisis relocation planning interfaces are largely unpredictable, since there are few legal precedents on which predictions could be based. For example, the liability position of physicians and other health care providers is unclear with respect to licensure restrictions, good samaritan acts, and other aspects of providing care during an emergency period. It does appear, however, that federally employed health care providers would be immune from state laws during crisis relocation if they are acting under proper authorization. There is a need for both federal and state legislation addressing some of the problems that can be anticipated now.

A checklist of legal questions to be considered in planning for the management of medical problems during crisis relocation was prepared. The checklist covers license laws, liability, statutory obligations, hospital privileges, and drug laws for in- and out-of-state providers. It also includes questions concerning facility licensing, liability and reimbursement.

## REFERENCES

1. Laney, M. N., P. F. Giles, D. R. Johnston, and E. L. Hill, Management of Medical Problems Resulting from Population Relocation, Vol. II. Research Triangle Park, North Carolina: Research Triangle Institute, May 1976.

## II. PROBLEMS ASSOCIATED WITH THE CONSOLIDATION OF RISK-AREA HOSPITAL PATIENTS

### A. Introduction

This chapter describes the results of research on problems associated with the consolidation of nonrelocatable hospital patients into one or a few risk-area hospitals during crisis relocation. The chapter determines the types and percentages of nonrelocatable patients in risk-area hospitals that would be candidates for consolidation and examines the likelihood of one hospital having the necessary resources to care for such patients. Finally, alternative approaches to the consolidation of nonrelocatable patients are proposed and evaluated.

#### 1. Background

In an earlier study of the medical problems of population relocation [Ref. 1], consolidation of nonrelocatable hospital patients, (i.e., patients either too ill or too severely injured to be moved to a host area), into one or a few risk-area hospitals was proposed.\* The alternative, of course, was to keep all of the general medical-surgical hospitals in the risk area open (and staffed), since all such hospitals have some nonrelocatable patients. Since most host areas were expected to have shortages of health service workers, keeping risk-area hospitals open, and thereby tying up workers who would otherwise be able to serve in host areas, was judged an unacceptable alternative. Another consideration which supported consolidation was the very

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\*As used herein, the term "nonrelocatable" means that the patients are not relocatable to a host area. However, these patients can be moved short distances within risk areas. It should be recognized that moving some critically ill patients, even for short distances, involves the risk that their conditions may be worsened by the move. Indeed, the trauma associated with being moved may prove fatal for some patients.

real question of the host-area availability of the resources required to provide care for nonrelocatable patients.

## 2. Objectives

The general objective of this research was to investigate the problems associated with the consolidation of risk-area hospital patients and resources during crisis relocation. Specific objectives were to:

- . Determine types and percentages of patients with conditions preventing them from being relocated,
- . Determine the likelihood of one risk-area facility having the resources needed to care for such patients, and
- . Propose alternative approaches to hospital patient consolidation suitable for various community situations.

## B. Types and Percentages of Nonrelocatable Patients

The methods employed to determine the types of nonrelocatable patients and to estimate their percentages in general, medical-surgical hospitals, and the resulting estimates by condition are presented in this section.

### 1. Methods

Information on the conditions (diagnoses) of patients in non-Federal, short-stay hospitals in the U.S. was obtained from Inpatient Utilization of Short-Stay Hospital, U.S. - 1974 [Ref. 2]. This publication, thought to be the most comprehensive treatment of the subject available, provided estimates of the total number of patients in all non-Federal, short-stay hospitals, by diagnosis for 120 diagnoses. Length of hospital stay (in days) by diagnosis was also provided. By dividing the estimated number of patients with a given diagnosis by the estimated number of patients for all diagnoses and multiplying by 100, the percentage of patients with a given diagnosis was obtained. In this manner, estimates of the percent of total patients represented by each of the 120 diagnoses were made. Since length of stay varies for different diagnoses, the percentage estimates were adjusted for length of stay by multiplying them by the ratio of length of stay for the



diagnosis of interest to the average length of stay for all diagnoses. This provided estimates of the percent of hospital patients with a given diagnosis weighted for length of stay.

Concurrently, the list of 120 diagnoses, plus eight diagnoses for newborns (newborns were not included in Inpatient Utilization of Short-Stay Hospitals, U.S. - 1974), was submitted to three medical consultants for evaluation. (The list of diagnoses may be found in Appendix II-A.) The medical consultants selected to perform the evaluation were a surgeon and an internist, both experienced in emergency medicine, and a pediatrician with a background in research. Following a face-to-face briefing on crisis relocation and the consolidation problem by an RTI staff member, each consultant was asked to estimate, on the basis of his experience, the percent of patients that could be discharged outright and the percent that could be relocated to a host area for each of the 128 diagnoses. The percent of nonrelocatable patients with a given diagnosis was obtained by difference, i.e.,  $[100\% - (\% \text{ discharged} + \% \text{ relocated}) = \% \text{ nonrelocatable}]$ . Finally, the percent of nonrelocatable patients in the hospital with a particular diagnosis was obtained by multiplying the percent of hospital patients weighted for length of stay by the percent of nonrelocatable patients with that diagnosis.

The following example will illustrate the computation. In 1974, there were an estimated 217,000 patients with viral disease, and an estimated 33,018,000 patients in all, discharged from short-stay hospitals. The average length of stay for viral disease was 6.9 days, while for all conditions it was 7.7 days.

The percent of patients with viral disease is:

$$\frac{217(10^3)}{33,018(10^3)} \times 100 \cong 0.66$$

Weighted for length of stay, it becomes:

$$0.66\% (6.9/7.7) \cong 0.59\%$$

Since the medical consultants estimated that 5 percent of viral disease patients would be nonrelocatable, the percent of all hospital patients that are nonrelocatable viral disease patients is:

$$0.59\% \times 0.05 \cong 0.03\%$$

## 2. Results

The same calculations were performed for each of the 128 diagnoses and the results were aggregated into 16 diagnostic categories (patient types) as shown in Table II-1. As might be expected, patients with neoplasms; conditions of the circulatory, respiratory, and digestive systems; and accident victims account for much of the estimated 9.5 percent of all hospital patients that are considered nonrelocatable. This research provides an independent confirmation of Brown's 1963 estimate that 10 percent of hospital patients were nonrelocatable or, as he put it, "hardcore" [Ref. 3].

The 9.5 percent estimate for nonrelocatable patients, thus obtained, is a planning factor that can be used to make estimates of the numbers of nonrelocatable patients to be expected in a "typical" short-stay, medical-surgical hospital. To be sure, individual hospitals may, at any given time, have more or less than 9.5 percent of its census made up of nonrelocatable patients. For example, referral hospitals will likely have a somewhat higher percentage of nonrelocatable patients. Nevertheless, it is believed that useful estimates for medical planning purposes can be made using the 9.5 percent figure.

### C. Likelihood of One Hospital Serving as a Consolidation Facility

To determine the likelihood of one hospital having the necessary resources to care for nonrelocatable patients, two approaches were used. The first approach was to estimate the numbers of nonrelocatable patients in

Table II-1. Types and Percentages of Nonrelocatable Patients in Short-Stay Hospitals

Patient Type	Percent of All Patients
Infective Disease	0.1
Neoplasm	1.2
Endocrine, Nutritional, Metabolic Disease	0.1
Blood, Blood-Forming Organ	0.05
Mental Disorder	0.1
Nervous System, Sense Organ	0.2
Circulatory System	2.4
Respiratory Disease	0.8
Digestive System	0.9
Genitourinary	0.4
Pregnancy, Childbirth	0.5
Skin and Subcutaneous Tissue	0.03
Musculoskeletal	0.3
Congenital, Perinatal, Ill-Defined	0.25
Accident, Poisoning	1.7
Newborn	<u>0.5</u>
Total	9.53

six risk areas selected in consultation with the Contracting Officers' Technical Representative (COTR) and to determine if any one hospital in each risk area had sufficient beds to accommodate the estimated number of patients. The second approach was to examine resource requirements, in addition to beds.

1. Beds Required for Nonrelocatable Patients

The six risk areas selected for study were Colorado Springs, Colorado; Macon, Georgia; Utica-Rome, New York; Raleigh, North Carolina; San Antonio, Texas; and Washington, D. C. The number of nonrelocatable patients in each risk area hospital was estimated by taking 9.5 percent of the beds.\* (Psychiatric and military hospital beds were not included in the estimates.) For each risk area, the estimates of nonrelocatable patients in each hospital were summed to obtain a total for the risk area. This total was then compared with the number of beds in each risk-area hospital to determine if any of the facilities were large enough to accommodate all of the nonrelocatable patients. The results of this procedure are shown in Tables II-2 through II-7, and a discussion of the results follows Table II-7.

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\*Beds, rather than patient census, was used in order to produce a more conservative estimate of nonrelocatable patients.



Table II-2. Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Colorado Springs Risk Area

Hospital	No. of Beds*	Estimated No. of Nonrelocatable Patients
Community	88	8
Eisenhower Osteopathic	122	12
Memorial	146	14
Penrose	372	35
St. Francis	187	18
Total	915	87

\*Source: Guide to the Health Care Field. Chicago, Illinois: American Hospital Association, 1977.

Table II-3. Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Macon Risk Area

Hospital	No. of Beds*	Estimated No. of Nonrelocatable Patients
Coliseum Park	258	25
College Street	55	5
Medical Center of Central Georgia	481	46
Middle Georgia	166	16
Total	960	91

\*Source: Guide to the Health Care Field. Chicago, Illinois: American Hospital Association, 1977.

Table II-4. Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Utica-Rome Risk Area

Hospital	No. of Beds*	Estimated No. of Nonrelocatable Patients
Faxton (Utica)	153	15
Rome (Rome)	191	18
Rose (Rome)	104	10
St. Elizabeth (Utica)	276	26
St. Luke's (New Hartford)	262	25
Total	986	94

\*Source: Guide to the Health Care Field. Chicago, Illinois: American Hospital Association, 1977.

Table II-5. Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Raleigh Risk Area

Hospital	No. of Beds*	Estimated No. of Nonrelocatable Patients
Mary Elizabeth	49	5
Rex	353	34
Wake Medical Center	435	41
Total	837	80

\*Source: Guide to the Health Care Field. Chicago, Illinois: American Hospital Association, 1977.

Table II-6. Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in San Antonio Risk Area

Hospital	No. of Beds*	Estimated No. of Nonrelocatable Patients
Alamo General	45	4
Audie Murphy Memorial Veterans	628	60
Baptist Memorial Hospital System	1,068	102
Bexar County	482	46
Lutheran General	185	18
Metropolitan General	221	21
Nix Memorial	186	18
Park North General	89	8
San Antonio Community	256	24
Santa Rosa Medical Center	1,015	96
Southwest Texas Methodist	487	46
Total	4,662	443

\*Source: Guide to the Health Care Field. Chicago, Illinois: American Hospital Association, 1977.

Table II-7. Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Washington, D. C. Risk Area

Hospital	No. of Beds*	Estimated No. of Nonrelocatable Patients
District of Columbia		
Capitol Hill	205	20
Childrens	220	21
Columbia Hospital for Women	154	15
D. C. General	646	62
Doctors	284	27
George Washington	535	51
Georgetown	424	40
Greater South East Community	418	40
Hadley Memorial	78	7
Howard University	422	40
Providence	355	34
Sibley Memorial	362	34
Veterans Administration	708	67
Washington	925	88
Montgomery County, Maryland		
Clinical Center, National Institutes of Health	541	51
Suburban Hospital	350	33
Montgomery General	198	19

(Continued)



Table II-7. Number of Hospital Beds and Estimated Number of Nonrelocatable Patients in Washington, D. C. Risk Area (Continued)

Hospital	No. of beds*	Estimated No. of Nonrelocatable Patients
Holy Cross	344	33
Washington Adventist	365	35
Prince George County, Maryland		
Prince George	625	59
Clinton Community	33	3
Doctors Hospital of Prince George County	230	22
Riverdale	76	7
Alexandria, Virginia		
Alexandria	391	37
Circle Terrace	122	12
Jefferson Memorial	119	11
Arlington, Virginia		
Arlington	350	33
National Orthopedic and Rehabilitation	141	13
Northern Virginia Doctors	267	25
Fairfax, Virginia		
Commonwealth	131	12
Fairfax	619	59
Mt. Vernon	100	10
Total	10,738	1,020

\*Source: Guide to the Health Care Field. Chicago, Illinois: American Hospital Association, 1977.

In Table II-2 it can be seen that four of the five hospitals have enough beds to serve as a consolidation facility for the estimated 87 nonrelocatable patients in Colorado Springs. Since all of the hospitals are within a 10 mile radius of the center of Colorado Springs, distance is not an important consideration. Penrose Hospital, by virtue of its size and range of services provided, is a likely candidate for a consolidation facility.

Three of the four hospitals in the Macon risk area have enough beds to handle the estimated 91 nonrelocatable patients (see Table II-3). However, the Medical Center of Central Georgia with half of the risk area beds is the obvious choice for a consolidation facility.

Inspection of Table II-4 suggests that any one of the five hospitals in the Utica-Rome risk area is large enough to accommodate the estimated 94 nonrelocatable patients. However, since Utica and Rome are about 20 miles apart, the use of only one hospital for consolidation of nonrelocatable patients may not be practical. Perhaps the best solution for this risk area would be to use two hospitals: one hospital in Utica and one hospital in Rome.

The Raleigh risk area has two hospitals with enough beds to accommodate the estimated 80 nonrelocatable patients (see Table II-5). Wake Medical Center with more than 400 beds and a full range of services is the obvious choice for a consolidation facility.

For the San Antonio risk area (Table II-6), two hospitals will be needed to consolidate an estimated 443 nonrelocatable patients.

Inspection of Table II-7 indicates that no one hospital in the Washington, D. C. risk area has a sufficient number of beds to accommodate an estimated 1,020 nonrelocatable patients. Thus, it appears that three or four hospitals would be required.

In summary, it appears likely that nonrelocatable patients can be consolidated into a single hospital in each of the Colorado Springs, Macon and Raleigh risk areas. For the Utica-Rome risk area, one hospital would provide sufficient beds, but use of two hospitals, one in Utica and one in Rome, may be preferable, considering the distance between the two cities. The San Antonio and Washington, D. C. risk areas will need two and three or four hospitals, respectively, to care for their nonrelocatable patients. It is concluded that, from the standpoint of beds, consolidation of nonrelocatable patients into a small number of risk area hospitals during crisis relocation is a viable option for many risk areas.

2. Other Resources Required for Nonrelocatable Patients

The other resources required for the care of nonrelocatable patients are health services personnel and specialized items of equipment and supply.

a. Personnel

Before looking at the health services personnel requirements to care for nonrelocatable patients, it is appropriate to review hospital staffing for a normal patient load.

One of the most important health services workers is the nurse; estimates of nursing personnel requirements for various services and hospital sizes under normal circumstances are shown in Table II-8. The rates shown therein are national averages; individual hospitals will vary somewhat from these figures. A typical nursing staff includes not only registered nurses and licensed practical nurses, but also nurses aids. However, in the intensive care service, which has the highest nursing personnel requirement shown in Table II-8 (1.9 nurses per patient) and which appears to be a good model for a consolidated facility, nurses aids are usually not used [Ref. 4].

Table II-8. Nursing Personnel Requirements

Service	Nursing Hours/ Patient Day	Number of Nurses Per Patient
1. Obstetrical	6.3	0.77
2. Nursery	6.0	0.74
3. Medical-surgical	6.0	0.74
4. Intensive care	15.0	1.9
5. Operating room	9.5	1.2
6. Total hospital		
Under 50 beds	4.1	0.5
50-74	3.4	0.4
75-99	6.1	0.75
100-149	8.6	1.0
150-199	9.1	1.1
200-299	8.2	1.0
300-399	7.8	0.95
400+	7.6	0.93
Teaching	9.4	1.2

Source: Hospital Administrative Services, Six-Month National Data for Period Ending June 30, 1975. Chicago, Illinois: American Hospital Association, 1975, pp. 10, 11.



It is difficult to estimate physician requirements, since physicians are usually not hospital employees (except in some state and Federal facilities). As a rather rough, rule-of-thumb estimate, there is one physician required for every 15 hospital patients [Ref. 5].

Administrative and other personnel make up the remaining staff. If an estimate of three fulltime employees per occupied hospital bed [Ref. 6] is used, and each patient requires one nurse (see Table II-8), there are two administrative and other employees per patient.

Estimates of the numbers of health services personnel required to care for 100 nonrelocatable patients are shown in Table II-9. The estimates assume a level of care equivalent to that provided during normal circumstances. The numbers of personnel per 100 patients in normal circumstances are also shown in parentheses ( ) for comparison.

As shown in Table II-9 the estimated numbers of administrative, dietetic, laboratory, pharmacy, radiology, and non-professional/non-technical personnel required to care for nonrelocatable patients are not expected to differ from the numbers required under normal circumstances. On the other hand, it may be possible to reduce the numbers of personnel in the "other professional" category, which includes occupational therapists, social workers, etc., by one-half.

Substantially more medical, nursing and respiratory therapy personnel will be required to care for 100 nonrelocatable patients. The nursing personnel estimate of 190 per 100 nonrelocatable patients corresponds to the rate that prevails in intensive care units. One medical specialist for each of the 16 types of patients listed in Table II-1 (i.e., an infectious disease specialist for the infective disease patients, an orthopedist for patients

Table II-9. Estimate of Personnel Required to  
Care for Nonrelocatable Patients

Personnel Category	No. of Personnel/100 Nonrelocatable Patients	
Administrative	3	(3)*
Dietetic	4	(4)
Laboratory	23	(23)
Medical	16**	(6-7)
Nursing	190	(116)
Pharmacy	4	(4)
Radiology	12	(12)
Respiratory Therapy	10	(5)
Other Professional	13	(26)
Non-Professional/Non-Technical	120	(120)
Total	395	(320)

\*Numbers in parentheses are for normal circumstances and, with the exception of the medical category, were calculated from detailed data for the five hospitals in Colorado Springs provided by the Southeast Colorado Health Systems Agency, Inc., Colorado Springs, Colorado.

\*\*A specialist corresponding to each of the 16 patient types listed in Table II-1 was assumed.

with musculoskeletal problems, etc.) is suggested.\* Finally, an estimate of 10 respiratory therapists (twice normal) per 100 nonrelocatable patients is made.

The total of 395 workers per 100 nonrelocatable patients falls between an estimate of 260 made by an assistant administrator at the Medical Center of Central Georgia in Macon [Ref. 7] and an estimate of 450 made by an assistant administrator at Penrose Hospital in Colorado Springs [Ref. 8].

If the personnel estimates shown in Table II-9 are constant, regardless of the size of the nonrelocatable patient population, then there would be no savings in hospital personnel as a result of consolidating nonrelocatable patients. In that case, it would be more appropriate to retain nonrelocatable patients in the hospital in which they were located than to consolidate them into another facility, unless of course, consolidation was indicated for other reasons. However, there is reason to believe that the estimates are not constant over all patient population sizes. In Figure II-1 the ratio of hospital personnel to patients is plotted against number of patients (the curve is not mathematically fitted). The data points shown in the figure were calculated from data on number of hospitals, average daily census, and number of personnel (all types), all by bed-capacity ranges, for general hospitals in 1970 as published in Hospitals [Ref. 9]. The figure indicates that the ratio of personnel to patients decreases as the number of patients, until a value somewhere between 50 and 100 patients is reached, when it begins to increase even though the number of patients continues to decrease. The left leg of the curve represents small hospitals which provide only basic inpatient services; the right leg represents larger hospitals which provide comprehensive services

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\*Dr. Don Harris of Eisenhower Osteopathic Hospital, Colorado Springs, Colorado originally suggested this approach to the assignment of physicians.

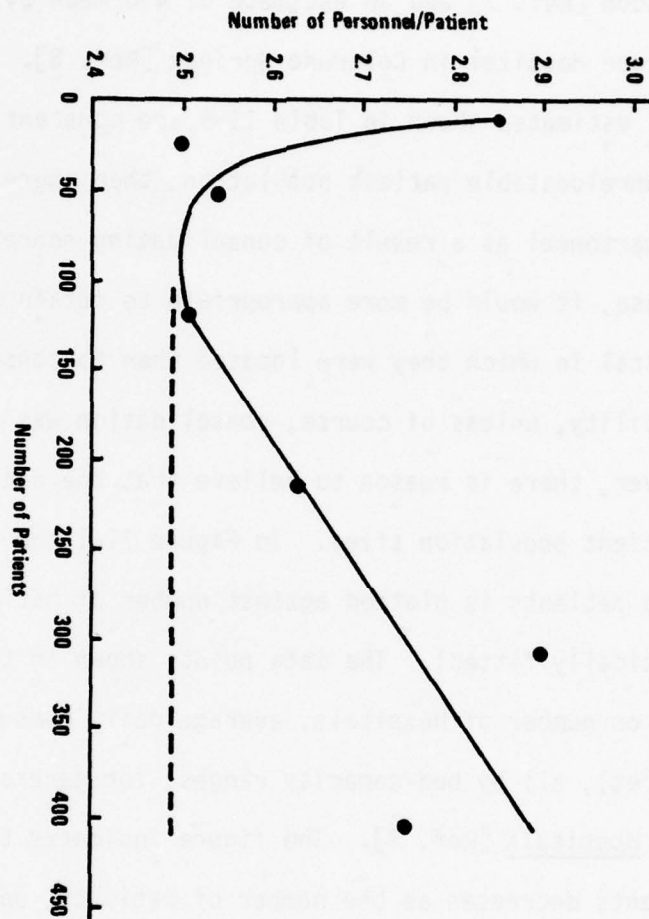


Figure II-1. Number of hospital personnel per patient versus number of patients, general hospitals, U.S., 1970.



and, therefore, require more personnel. The dashed line drawn parallel to the abscissa just below 2.5 personnel per patient on the ordinate is considered a baseline for providing basic inpatient services. The reason that the smaller patient populations require a higher ratio of personnel is simply that a certain minimum number of personnel is required to operate a facility. Put another way, a patient population must reach a certain size to achieve any economies of scale in its personnel requirement. Thus, small (less than 50) patient populations require more personnel per patient for basic inpatient services than do larger populations.

If the relationship shown in Figure II-1 is applicable to nonrelocatable patients and to the personnel categories listed in Table II-9\*, then it appears that patient populations less than 50 in number should be consolidated into another facility and that health services workers could be freed to serve elsewhere by doing so.

b. Equipment and Supplies

Nonrelocatable patients are, for all intents and purposes, intensive care patients. As such, they will frequently need intravenous fluids and oxygen, as well as other essential supplies such as blood, antibiotics, analgesics, dressings, etc.

The equipment that will be required to care for some nonrelocatable patients is varied and includes such items as ventilators, suction machines, tube feeders, cardiac monitors, misters, dialysis machines and traction devices.

Data on the numbers of pieces of equipment used in hospitals are not readily available. Equipment such as cardiac monitors, ventilators, and suction machines is found in all intensive care units and the number of units

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\*Data by personnel category could not be located for analysis.

of equipment is related to the number of patients or beds. However, this equipment is also found in other parts of the hospital to a lesser degree and no one, to our knowledge, has estimated the total number of monitors, ventilators, etc., per hospital.

The quantity of medical supplies in a hospital is also difficult to determine. The volume of supplies moving through a hospital is large, and it is on the increase. One of the more critical supplies is blood. It is felt that maintaining a supply of blood serum, platelets, and whole blood is important in providing care for nonrelocatable patients. Other supplies - antibiotics, fluids, dressings, syringes, etc., - are usually stocked somewhat thinly because there are shipments of these items to a hospital two or three times a week under normal circumstances. Thus, without resupply, the consolidation facility will exhaust its inventories in less than the two-week period assumed for relocation.

While the hospital(s) selected to serve as a consolidation facility may not possess all of the personnel and equipment and supplies required to care for nonrelocatable patients, that need not be an insurmountable problem. The problem could be largely solved by moving equipment, as it is possible to do so, and supplies from the hospitals that are closing to the consolidation facility. Similarly, intensive care nurses from the hospitals that are closing could be assigned to the consolidation facility.

#### D. Alternative Approaches to Consolidation

In this section, alternative approaches to the consolidation of nonrelocatable patients are proposed and evaluated. Initially, several alternative approaches are enumerated and discussed in general terms. Approaches for the consolidation of nonrelocatable patients in the Colorado Springs, Macon and Utica-Rome risk areas are considered in more detail.

## 1. Evaluation of Alternative Approaches

One approach is to consolidate patients within the hospital in which they are located. This is a relatively easy task and many hospital disaster plans include an organizational framework for performing consolidation. One advantage of such internal consolidation is that trauma to acute-care patients is minimized. Logistically, it is the simplest approach to consolidation and, therefore, puts the least amount of strain on the hospital staff. It also preserves the autonomy of individual hospitals. However, when compared with between-hospital approaches, the savings in staffing and resources are unimpressive. Providing care for even a small number of patients will require the hospital to keep most of its services staffed and operating. The expenditure of resources to keep all risk-area hospitals operating does not appear to be justified, considering the low occupancy rates that would prevail. Thus, it appears that there would be little savings, if any, in resources if hospitals consolidate within themselves. Accordingly, the consolidation alternatives that are proposed below are all between-hospital approaches.

Alternative approaches to consolidation include:

- Consolidation of nonrelocatable patients into one (or a few) hospitals providing all required services;
- Consolidation of nonrelocatable patients into a reduced number of hospitals on the basis of type of condition;
- Consolidation of nonrelocatable patients into the facility providing the greatest protection, other things being equal;
- Consolidation of hospital services (e.g., food, laundry, and laboratory), if more than one risk area facility must remain open; and
- Combinations of the alternatives listed above.

Determining which hospital(s) should remain open and accept patients from other hospitals involves consideration of a number of factors including:

- Location -- central and/or easily accessible,

- Layout -- smooth flow of patients and supplies,
- Services -- full range for intensive care,
- Protection -- fallout and blast, and
- Size -- beds for the projected number of patients.

Logistically, the consolidation problem becomes more difficult, the more patients there are to be consolidated. Consolidating patients into one hospital is the simplest situation. The more hospitals that have patients to be consolidated, the greater will be the difficulty in coordinating the movement of people, equipment and supplies.

If nonrelocatable patients can be consolidated into one hospital (or a few hospitals), health services workers from the hospitals transferring patients to the consolidation facility will be freed to serve in a host area. As noted above, keeping many hospitals with low occupancy rates open during crisis relocation is not an efficient use of health resources. On the other hand, consolidation of nonrelocatable patients into one hospital should lead to a more efficient use of available resources. Since only about 9.5 percent of all hospital patients fall into the nonrelocatable category, it is believed that many risk areas have at least one hospital with enough beds to accommodate the risk-areas' nonrelocatable patient population. The largest risk areas obviously will find it necessary to keep more than one hospital open, but in none will it be necessary to operate more than a small fraction of the total number of hospitals therein. (See Section C of this chapter.)

One advantage of consolidating patients between hospitals is that the duplication of services is greatly reduced. In the largest risk areas of the United States, which have a number of specialty hospitals, it may be logical to consolidate nonrelocatable patients on the basis of type of condition, e.g., by grouping all burn patients in a burn center, all patients with



circulatory conditions in another hospital, etc. Almost without exception, the nonrelocatable patients who are consolidated will require intensive care; too many patients with similar problems may overtax an individual hospital's ability to provide the required services. Thus, a hospital housing patients with a wide spectrum of diagnoses may be more manageable than one with only coronary care patients.

Another alternative approach is to consolidate hospital patients into the hospital that provides the greatest fallout protection (highest protection factor) and greatest blast protection. If beds and other resources are equal in the hospitals being considered as consolidation facilities, and no locational advantage is apparent, the hospital(s) offering the greatest protection should be selected.

If more than one hospital in an area remains open, there may be ways to reduce the numbers of services that must be provided by each hospital. For example, if the hospitals are located reasonably close to one another, then one or the other could provide laboratory, laundry, dietary, and pharmacy services for both hospitals.

## 2. Approaches to the Consolidation of Nonrelocatable Patients in Three Risk Areas

Three risk areas were selected in consultation with the COTR for more detailed study: Colorado Springs, Macon and Utica-Rome. Approaches to the consolidation of nonrelocatable patients were proposed for and tested in each risk area.

### a. Colorado Springs

Four of the five Colorado Springs hospitals have enough beds to handle the projected number (87) of nonrelocatable patients. (With 88 beds, Community Hospital is too small for consideration as a consolidation facility by itself.) If, however, not all of the relocatable patients are removed to

the host area, neither Eisenhower Osteopathic Hospital nor St. Francis Hospital would be a good choice as a consolidation facility. Both Memorial Hospital (which will expand to 300 beds in the near future) and Penrose Hospital are large enough to accommodate nonrelocatable patients, as well as other patients who may remain in Colorado Springs. Penrose, the largest hospital with 372 beds, could accommodate all of the nonrelocatable patients, using less than one-fourth of its beds. Penrose Hospital appears to be the logical choice for a consolidation facility for several reasons. Since 35 of the estimated 87 nonrelocatable patients will probably be in Penrose Hospital, selecting it as the consolidation facility would minimize the number of patients that would be transferred from one hospital to another. Penrose Hospital has the largest number of intensive care beds, and is no more than four miles distant from the other four hospitals.

Moving approximately 50 nonrelocatable patients to Penrose Hospital should not present great problems for the ambulance services in Colorado Springs, given up to 72 hours to complete the move.

Staffing Penrose Hospital to provide care for 87 nonrelocatable patients during crisis relocation would require an estimated 346 persons. Staffing estimates by personnel category are shown in Table II-10. As noted earlier [Ref. 8], an assistant administrator at Penrose Hospital estimated that about 450 people would be required to operate the facility for 100 nonrelocatable patients. Also, it will be necessary to assign intensive care nurses from the other hospitals to Penrose.

b. Macon

There are four hospitals in Macon, three of which are general hospitals. The Medical Center of Central Georgia is the largest (481 beds) and most comprehensive medical care facility in the area and serves as a

Table II-10. Staffing Estimates for Penrose Hospital  
During Crisis Relocation

Personnel Category	No. of Personnel
Administrative	3
Dietetic	4
Laboratory	20
Medical	16
Nursing	165
Pharmacy	4
Radiology	10
Respiratory Therapy	9
Other Professional	11
Non-Professional/Non-Technical	104
Total	346

referral hospital for the region. Coliseum Park Hospital is a 258 bed facility and Middle Georgia Hospital has 166 beds. Middle Georgia Hospital is located on the same grounds as the Medical Center of Central Georgia. Riverside Clinic Hospital was not considered, since it provides limited hospital services and its patients are not at all typical of those found in general hospitals. Its patients tend to have either minor surgical problems or other problems, such as alcoholism.

Macon is a good example of a city with hospitals of varying size in which the largest and best equipped hospital provides care for the most acutely-ill patients and provides many services not found in other local hospitals. What this means is, the Medical Center of Central Georgia probably has more than the estimated 46 nonrelocatable patients (see Table II-3). Likewise, Middle Georgia Hospital probably has fewer nonrelocatable patients than were estimated.

The Medical Center of Central Georgia could comfortably handle the projected number of nonrelocatable patients (91) and it is the obvious choice for a consolidation facility. With at least 50 percent of the estimated nonrelocatable patients already located in the Medical Center of Central Georgia, only 45 patients would have to be moved. The Medical Center of Central Georgia has ten ambulances; transporting an estimated 30 patients from Coliseum Park and College Street Hospitals should be no problem. Moving an estimated 16 nonrelocatable patients from Middle Georgia Hospital, located adjacent to the Medical Center of Central Georgia, would present even less of a problem.

Staffing the Medical Center of Central Georgia to provide care for 91 nonrelocatable patients during crisis relocation would require an estimated 362 people. Staffing estimates by personnel category are shown in Table II-11.



Table II-11. Staffing Estimates for Medical Center of  
Central Georgia During Crisis Relocation

Personnel Category	No. of Personnel
Administrative	3
Dietetic	4
Laboratory	21
Medical	16
Nursing	173
Pharmacy	4
Radiology	11
Respiratory Therapy	9
Other Professional	12
Non-Professional/Non-Technical	109
Total	362

As noted earlier [Ref. 7], an assistant administrator at the Medical Center of Central Georgia estimated that 260 persons would be sufficient to care for 100 nonrelocatable patients.

c. Utica-Rome

In considering the consolidation of nonrelocatable patients in the Utica-Rome risk area, the two most important factors are the distance between the cities of Rome and Utica -- approximately 20 miles, and the differing manpower requirements for operating one versus two hospitals. The advantage (reduced personnel requirement) of consolidating patients into one facility may be outweighed by the problems of moving patients from Rome to Utica. Transporting patients this distance is not a matter of vehicles, but rather, it is that critically-ill patients may be traumatized by a move of more than a few miles.

St. Elizabeth and St. Luke's Hospitals are the two largest facilities in the risk area and both are located in or near Utica. Whether patient consolidation involved one or two hospitals, either St. Elizabeth or St. Luke's Hospital would be a reasonable choice as a consolidation facility. They are the largest hospitals in the risk area and are similar in size and in number of critical care beds, i.e., intensive care, cardiac care, recovery room, and premature nursery. Of the two hospitals, St. Elizabeth is located more conveniently and also is slightly more protected, since St. Luke's is located higher on a hill. The advantages offered by St. Elizabeth Hospital, though slight, would make it the preferred facility for consolidation in Utica. It could handle, based on number of beds (276), the nonrelocatable patients from both Utica and Rome, plus any additional patients which may not be transported to host areas due to shortages in host area facilities.

There are two hospitals in the city of Rome. Rome Hospital, with 191 beds, is the largest and could accommodate the estimated 94 nonrelocatable patients in the risk area. Rose Hospital has 104 beds.

Considering the distance between Utica and Rome, and the conditions of the patients, consolidation of Utica patients (66) into St. Elizabeth Hospital and Rome patients (28) into Rome Hospital appears to be the best approach. Staffing St. Elizabeth and Rome Hospitals to provide care for 94 nonrelocatable patients during crisis relocation would require an estimated total of 391 people. Staffing estimates by personnel category are shown in Tables II-12 and II-13 for St. Elizabeth and Rome Hospitals, respectively. The estimates for Rome Hospital were not adjusted for patient population size (see Figure II-1).

### 3. Testing

Each approach to the consolidation of nonrelocatable patients was tested in the risk area for which it was proposed. Thus, tests were conducted in Colorado Springs, Macon and Utica-Rome. A test consisted of a slide-illustrated presentation of the proposed consolidation approach by an RTI staff member to a group of risk-area civil preparedness officials and hospital administrators. Test participants were asked to evaluate the approach proposed for their area. In the discussion that followed the presentation, many of the planners' and administrators' criticisms and concerns were aired and useful suggestions were made. Participants' suggestions were used, as appropriate, to revise the consolidation approaches.

Table II-12. Staffing Estimates for St. Elizabeth  
Hospital During Crisis Relocation

Personnel Category	No. of Personnel
Administrative	2
Dietetic	3
Laboratory	15
Medical	16
Nursing	125
Pharmacy	3
Radiology	8
Respiratory Therapy	7
Other Professional	9
Non-Professional/Non-Technical	79
Total	267



Table II-13. Staffing Estimates for Rome Hospital  
During Crisis Relocation

Personnel Category	No. of Personnel
Administrative	1
Dietetic	1
Laboratory	7
Medical	16
Nursing	53
Pharmacy	1
Radiology	4
Respiratory Therapy	3
Other Professional	4
Non-Professional/Non-Technical	34
Total	124

APPENDIX II-A:

LIST OF DIAGNOSES SUBMITTED TO MEDICAL CONSULTANTS

Appendix II-A: List of Diagnoses Submitted to Medical Consultants

Infective and parastic diseases

- Diarrheal diseases
- Viral diseases
- Other infective and parasitic diseases

Neoplasms

Malignant neoplasms

- Buccal cavity and pharynx
- Large intestine and rectum
- Other digestive organs and peritoneum
- Thoracic organs
- Bone, connective and other soft tissue, and skin
- Breast
- Uterus and other female genital organs
- Prostate
- Urinary organs
- Lymphatic and hematopoietic tissues
- Other and unspecified sites

Benign neoplasms and neoplasms of unspecified nature

- Uterine fibroma and other benign neoplasms of uterus
- Other female genital organs
- Other and unspecified organs and tissues and neoplasms of unspecified nature

Endocrine, nutritional, and metabolic diseases

- Diseases of thyroid gland
- Diabetes mellitus
- Other endocrine diseases
- Nutritional deficiencies and metabolic diseases

Diseases of the blood and blood-forming organs

- Anemias
- Other diseases of the blood and blood-forming organs

Mental disorders

- Psychoses
- Anxiety Neurosis
- Other neuroses and personality disorders
- Alcoholism
- Drug dependence
- Other mental disorders

#### Diseases of the nervous system and sense organs

- Disease of central nervous system
- Diseases of nerves and peripheral ganglia
- Cataract
- Other conditions and diseases of eye
- Diseases of ear and mastoid process

#### Diseases of the circulatory system

- Active rheumatic fever and chronic rheumatic heart disease
- Hypertensive disease
- Acute myocardial infarction
- Chronic ischemic heart disease
- Other ischemic heart disease
- Congestive heart failure
- Other heart disease
- Cerebrovascular disease
- Arteriosclerosis
- Varicose veins of lower extremities
- Hemorrhoids
- Other diseases of veins, lymphatics, and other circulatory system

#### Diseases of the respiratory system

- Acute bronchitis and bronchiolitis
- Acute upper respiratory infections, except influenza
- Influenza
- Pneumonia, all forms
- Bronchitis, chronic and unqualified
- Emphysema
- Asthma
- Hypertrophy of tonsils and adenoids
- Other disease of the respiratory system

#### Diseases of the digestive system

- Diseases of oral cavity, salivary glands, jaws, and esophagus
- Ulcer of stomach, duodenum, peptic ulcer of unspecified site, and gastrojejunal ulcer
- Gastritis and duodenitis
- Appendicitis
- Inguinal hernia
- Other hernia of abdominal cavity
- Intestinal obstruction without mention of hernia
- Gastroenteritis and colitis, except ulcerative, of noninfectious origin
- Chronic enteritis and ulcerative colitis
- Functional disorders of intestines
- Diverticula of intestine
- Cholelithiasis
- Cholecystitis and cholangitis, without mention of calculus
- Other diseases of liver, gallbladder, biliary ducts, and pancreas
- Other diseases of the digestive system



## Diseases of the genitourinary system

- Nephritis and nephrosis
- Infections of kidney
- Calculus of kidney and ureter
- Other diseases of kidney and ureter
- Cystitis
- Other diseases of urinary system
- Hyperplasia of prostate
- Other diseases of male genital organs
- Diseases of breast (including male breast)
- Cervicitis
- Uterovaginal prolapse
- Other diseases of uterus
- Intermenstrual bleeding
- Other disorders of menstruation
- Other diseases of female genital organs

## Complications of pregnancy, childbirth, and the puerperium

- Complications of pregnancy
- Abortion
- Delivery without mention of complication
- Delivery with complications
- Other complications of pregnancy, childbirth, and puerperium

## Diseases of the skin and subcutaneous tissue

- Infections of skin and subcutaneous tissue
- Other diseases of skin and subcutaneous tissue

## Diseases of the musculoskeletal system and connective tissue

- Osteoarthritis and allied conditions
- Other arthritis and rheumatism
- Displacement of intervertebral disc
- Vertebrogenic pain syndrome
- Synovitis, bursitis, and tenosynovitis
- Other diseases of musculoskeletal system

## Congenital anomalies

## Certain causes of perinatal morbidity and mortality

## Symptoms and ill-defined conditions

- Symptoms referable to respiratory system
- Symptoms referable to abdomen and gastrointestinal system
- Other symptoms
- Senility and ill-defined diseases

## Accidents, poisonings, and violence (nature of injury)

- Fracture of skull and face bones
- Fracture of upper limb
- Fracture of neck of femur

Other fracture of lower limb  
Fracture of other and multiple sites  
Dislocation without fracture  
Sprains and strains of back (including neck)  
Intracranial injury (excluding those with skull fracture)  
Internal injury of chest, abdomen, and pelvis  
Laceration and open wound of eye, ear, and head  
Laceration and open wound of other and multiple locations  
Burns  
Other injuries  
Adverse effects of medical agents  
Complications peculiar to surgical procedures and other medical care  
Other adverse effects of chemical and other external causes

#### Newborn

Without complications  
Immaturity  
Infective diseases, parasitic diseases  
Respiratory system diseases  
Congenital malformations  
Birth injuries  
Asphyxia and atelectasis  
Hemolytic diseases

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### III. IMPACT OF EVACUATION OF WAR THEATER CASUALTIES ON INTRA-U.S. FACILITIES

#### A. Introduction

This chapter discusses the potential impact of evacuating war theater casualties to civilian hospitals in the United States at a time when the country is in a crisis relocated posture. Current Department of Defense (DoD) thinking on the disposition of war theater casualties is reviewed in light of the emerging crisis relocation strategy for civil population protection and potential problems are identified. Civil preparedness plans to cope with the identified potential problems are suggested. This chapter concludes with a recommendation for additional analyses.

#### 1. Background

For a number of reasons that are discussed in Section B. of this chapter current DoD thinking calls for civilian hospitals and medical facilities in the United States to be used for the treatment of military casualties in the event of conventional war outside of the Continental United States. Many of the civilian facilities best prepared to provide the needed services for war theater casualties are, of course, situated in urban areas which may be at risk in the event of a nuclear attack on the United States. If crisis relocation is ordered, risk area populations will be evacuated to low-risk host areas. An earlier study performed for DCPA [Ref. 1] suggested that most patients, except for a relatively small number of nonrelocatable hospital and institutional patients (i.e., patients too ill or too severely injured to be moved to a host area), could be discharged and relocated to host areas. This earlier study also suggested that the nonrelocatable patients who remained in the risk area be consolidated into one or a few facilities in order to free health services personnel to serve



in host areas where the greatest portion of the population will be located. Thus, consolidation of patients would permit a small number of health services workers to commute in and out of the risk area on a daily basis in order to care for the nonrelocatable patients.

The results presented in the previous chapter (II) bear out the feasibility of civilian patient consolidation in risk area hospitals (Chapter II should be read as a background for this chapter). It appears, however, that if DoD were to decide that war theater casualties should be treated in civilian hospitals in the U.S., this decision would impact on the management of medical problems resulting from population relocation.

## 2. Objectives

The overall objective of this research was to investigate the impact of the evacuation of war theater casualties on intra-U.S. facilities. Specific objectives were:

- . to ascertain the resultant impact on medical problems resulting from civil population relocation, and
- . to suggest alternative plans to cope with these problems.

## B. Current DoD Medical Concerns

One of the current DoD medical concerns relates to conflicts involving U.S. forces in conventional warfare with engagements fought outside U.S. territory.\* In such a contingency, current thinking would call for the evacuation of war theater casualties for treatment at civilian hospitals in the U.S. that are under contract with DoD. War theater casualties are expected to represent a broad range of diagnoses and/or problems, including blunt trauma, neurosurgical, burns, psychiatric, etc. Some patients will be convalescent, requiring only medical supervision and general care, while

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\*Unclassified briefing by Col. John B. Kelly, Office of the Assistant Secretary of Defense (Health Affairs), on February 13, 1978.

others will arrive in need of major surgery. Under certain circumstances it is conceivable that casualties will only be given limited treatment and stabilized prior to evacuation to U.S. civilian facilities.

The reason for planning on the use of civilian hospitals is that the required military medical services cannot be mobilized rapidly enough should war break out. Since the authority to draft physicians and other health professionals expired in July 1974, the military services have experienced difficulties in maintaining an adequate level of medical manpower. Another factor contributing to the expected shortage of available military health services in the U.S. is that many active duty medical personnel will be assigned to the theater of operations in the event of war. Moreover, the aeromedical evacuation capability of DoD makes the use of civilian hospitals in the U.S. a feasible option for the treatment of casualties.

C. Impact on Medical Problems Resulting from Civil Population Relocation

For this examination of the impact on the medical problems of population relocation, it was assumed that crisis relocation will be ordered at a time when U.S. forces are already engaged in a conventional war. The possibility that conventional war could evolve into a crisis of such proportions that nuclear attack would appear imminent is worthy of consideration. For example, an enemy force experiencing a very heavy casualty rate in a conventional war might consider escalating the conflict to the level of nuclear war. It is in this context that the impact of the evacuation of war theater wounded on intra-U.S. facilities is discussed.

As noted earlier, current DCPA thinking is to close as many risk area hospitals as possible during crisis relocation and to consolidate nonrelocatable patients into a few hospitals. In this way many health services

workers would be freed to work in the host areas where they will be greatly needed. A small number of health services workers would commute in and out of the risk area daily to care for the nonrelocatable patients who remain behind.

Since most of the hospitals to which casualties would be sent are located in high-risk areas, and since many of these hospitals would not be staffed or operating during crisis relocation, it appears that, in the worst-case situation, DoD may be planning to send casualties to non-operating hospitals. Whether the worst case occurs will depend, in part, on the rapidity of crisis development and the evacuation policy\* of DoD and the theater of operations. For example, if the crisis develops slowly it may be expected that DoD will have expanded its hospital capability in the theater of operations, thereby reducing the flow of casualties to civilian hospitals in the U.S. If, on the other hand, the crisis develops rapidly, the worst-case situation may be approached. Similarly, a greater evacuation policy in the theater of operations will lessen the impact on U.S. civilian facilities, and conversely, a smaller evacuation policy will intensify and quicken the impact.

Depending on the timing of the order for crisis relocation, war theater casualties may be: (1) patients in civilian hospitals in the U.S., or (2) patients enroute to such facilities. Those military patients already in civilian hospitals who are well enough to travel can be discharged or

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\*For planning, a hospital system decides or assumes that it will retain for treatment only those patients who will return to duty within a given period. This period (in days) is the evacuation policy. Doctrinally, evacuation policy is set by the Secretary of Defense with the advice of the Joint Chiefs of Staff and upon the recommendation of the theater commander.

relocated to a host area hospital. However, many of the casualties who are patients in civilian hospitals are expected to fall into the nonrelocatable category that cannot be discharged or relocated to a host area hospital. Thus, the most likely impact on intra-U.S. facilities is one of increased numbers of patients remaining in risk area hospitals. Since the number of consolidated patients will be larger than would otherwise be expected, the required health services workers commuting to and from the risk area will also increase. At the same time, the number of health providers in host areas will be decreased by a like amount.

#### D. Alternate Plans

Plans suggested to cope with the problems discussed in the preceding section are based on the assumption that war theater casualties in civilian facilities will be treated in the same manner as civilian patients, i.e., they will not receive preferential treatment. Rather than alternate plans, it appears that civil preparedness planners will need to modify the health and medical annexes to their crisis relocation plans to account for increased patient loads. In particular, plans should be developed that provide for:

- . an increased number of nonrelocatable patients to be consolidated in risk area facilities,
- . an increased number of patients to be relocated to host areas,
- . the specialized services required by the nature of battle casualties in the amount needed in the risk area facilities; these services should be considered in selecting a hospital(s) for patient consolidation,
- . alternate receiving hospitals in host areas to take casualties incoming after crisis relocation has begun, and



- . additional transport to move convalescing war theater casualties from risk-area to host-area hospitals.

E. Recommendation

Once DoD planning progresses to the point of identifying specific civilian hospitals to which casualties will be shipped and estimates of casualty flows by risk area are available, quantitative assessments of the impact on the medical problems of population relocation should be made. The results of these assessments should be shared with local civil preparedness officials who are engaged in planning health and medical services for crisis relocation.

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#### IV. CAPABILITIES OF ALLIED MEDICAL FACILITIES AND APPLICATION IN CRISIS RELOCATION

##### A. Introduction

##### 1. Background

Previous research in crisis relocation suggests that the health and medical (h/m) problems of a relocated population will be those that are normally present in a population, plus a set of problems due to relocation itself. Thus, a relocated population will experience the usual number of acute and chronic conditions, some of which require professional attention. But, in addition, it is believed that there may be increased numbers of stress-induced problems and outbreaks of communicable disease.

Underlying the management of these problems is the fact that relocation will disrupt the normal consumer-provider relationships in health services. The effects of the disruption will be most acute in host areas where the resident h/m resources would be overwhelmed by the relocated population if no additional resources were provided [Ref. 1, Vol. I].

This chapter investigates the possibility of utilizing allied medical facilities (other than hospitals) during crisis relocation to help meet the increased demand for primary care services in host areas. Allied medical facilities, as used in this chapter, refers to the following facilities:

- . Nursing homes
- . Veterinary hospitals and clinics
- . Osteopathic offices
- . Chiropractic offices
- . Dental offices

## 2. Objectives

The objectives of the research described herein are:

- . To define the capabilities of allied medical facilities, and
- . To evaluate their application during crisis relocation.

## B. Facility Characteristics

Allied medical facilities are characterized in this section by primary function(s); services normally provided; and geographic distribution, particularly in host areas.

For each allied medical facility category, services provided can be expected to vary widely among individual facilities because of (1) variations in federal, state, and local government standards; (2) variations among requirements for association memberships; (3) participation in voluntary accreditation programs (e.g., the Joint Commission on Accreditation of Hospitals); and (4) differences in health care needs of different populations. Because of the differences in services that can be expected, it is feasible to provide information on the range of services that are available, or on the services that can be expected as a minimum. This information will assist planners in determining the potential usefulness of allied medical facilities in crisis relocation.

Information used to characterize facilities was obtained from government agencies, professional associations, and private organizations. Differences in the availability of information used to characterize the various facilities necessarily resulted in unevenness in the discussion of facility types. Thus, the sections on nursing homes and veterinary facilities are quite detailed, while the sections on chiropractic, osteopathic, and dental facilities for which detailed information was not readily available are brief. In describing the geographic distribution of facilities, host and risk areas were identified

using High Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes [Ref. 2]. Where a risk area extends into any part of a county, the entire county was treated as a risk area. Thus, a conservative estimate of actual host area facilities is obtained. However, this estimate is considered satisfactory for this level of research and it provides civil defense coordinators with a basis for planning health and medical services for crisis relocation. Local planners should survey the allied medical facilities in their area before preparing detailed crisis relocation plans.

1. Nursing Homes

- a. Definition

Nursing and related homes provide long term nursing, maintenance, and restorative care to patients who need such care but who do not need a physician's care or a hospital's services. Although patients of all ages may be found in nursing and related homes, the services, facilities and management are structured predominantly for the aged--approximately 89 percent of all nursing home patients are at least 65 years old [Ref. 3, p. 72].

Prior to today's nursing homes, institutions known as "almshouses" cared for the elderly poor. Almshouses generally provided low quality care for the aged as a result of inadequate budgets allotted by local governments that, in many instances, operated almshouses only because they were required by law to do so [Ref. 4, p. 14]. The Social Security Act of 1935 made Federal funds available to the needy aged, thus causing an increase in the number of privately operated boarding and nursing homes and a decrease in the number of almshouses [Ref. 5, p. 363]. Later amendments to the Social Security Act further changed practices of providing care for the aged in institutions.



Medicare (Title XVIII) was created by the 1965 amendments to the Social Security Act. It provided financing for up to 100 days of extended care services for persons 65 years and older in a federally-certified facility during a single spell of illness [Ref. 5, p. 363]. Under Medicare, certified facilities, called extended care facilities (ECF), provided post-hospital care at a level that was distinguished from the intensive care of hospitals by the absence of certain services (e.g., surgery, X-ray, and diagnostic laboratories).

The 1965 amendments to the Social Security Act also included Medicaid (Title XIX), which established state administered programs that reimburse certified skilled nursing care and intermediate care facilities. Title XIX specifies that, among other services, skilled nursing services and home health services must be offered to persons over 21 who qualify for benefits under the program [Ref. 5, p. 363].

As the quality of care has improved, the numbers of nursing and related homes and beds have increased as shown in Table IV-1. A discussion of the geographic distribution of these facilities is presented following a discussion of services that nursing homes provide.

b. Services Provided

In addition to beds, nursing and related homes provide limited medical and nursing services, the level of which is usually determined by the type of patients that the facility admits. There are homes that only admit persons who are healthy; these homes provide few health care services. In contrast, there are facilities that accept persons, who, because of poor health, require complete or partial care. Often these people are hospital discharges who no longer need the intensive care that hospitals provide, but who need long term care that is less expensive than continued hospitalization.

Table IV-1. Number of Nursing and Related Homes and Beds for  
Selected Years, United States, 1963-1973

	Selected Years		
	1963	1969	1973
Homes	16,701	18,910	21,834
Beds	568,560	943,876	1,327,704

Source: National Center for Health Statistics, Health Resources Statistics: Health Manpower and Health Facilities, 1975. Washington, D. C.: U. S. Government Printing Office, 1976.

They may need medication (by injection or orally), oxygen therapy, intravenous or nasal feeding, or other services that can be provided by a nursing home. Nursing homes may also have food and laundry services on the premises for their patients and residents.

Attempts to characterize the services that nursing homes can be expected to provide were made using information from several sources. Potential sources of information include Medicare-Medicaid certification requirements, the National Center for Health Statistics (NCHS), the Joint Commission on Accreditation of Hospitals (JCAH), and state licensing agencies. The Medicare-Medicaid requirements and the NCHS data were examined for pertinent information. Accreditation requirements for nursing homes administered by the JCAH will not be discussed here because few nursing homes are so accredited (as of June 1975, only 1,794 facilities, or a little over 8 percent of all nursing care and related homes, had been accredited by JCAH [Ref. 5, p. 365]). An excellent source of information on services, numbers, and locations of nursing homes can be found in state licensure agencies. All of the 50 states and the District of Columbia require licensure of nursing and related homes. However, minimum standards, rules, and regulations for these facilities are

not uniform from state to state and definitions of what constitutes a nursing home varies widely. It was not feasible to attempt to collect and evaluate all of the state licensing standards. Crisis relocation planners interested in the services offered by nursing homes in their areas should consult with their state agency responsible for the licensing of nursing homes.

(1) Medicare/Medicaid Certification Requirements [Refs. 6, 7]

The Social Security Amendments of 1972 (P.L. 92-603) combined certification requirements for ECF established under Medicare and skilled nursing homes (SNHs) established under Medicaid into certification requirements for what are now called skilled nursing facilities (SNFs). The 1972 amendments retained the classification "intermediate care facilities" (ICF) for facilities that provide for persons who do not need the degree of care provided by a SNF. Under Medicare/Medicaid certification requirements, SNFs must provide, or arrange for, the following:

- . Physician services
- . Nursing services
- . Dietetic services
- . Specialized rehabilitative services
- . Pharmaceutical services
- . Laboratory and radiologic services
- . Dental services
- . Social services

Each of these services will be briefly discussed.

Each patient must be under the care of a personal physician in order to be admitted and to remain in a SNF. A physical examination is required upon admission followed by physician visits at regular intervals.

The Medicare/Medicaid requirements for SNFs do not specify the nursing services to be provided, except that there must be 24-hour coverage by licensed nurses. Required nursing services depend on the patients accepted and the orders written by patients' physicians. For example, if a physician orders oxygen therapy for a patient and a nursing home accepts that patient, then the home must provide oxygen therapy for that patient. The home may refuse the patient and, therefore, not be required to provide oxygen therapy.

SNFs are required to provide dietetic services for patients. This may be done by having the food preparation facilities as an integral part of the nursing home, or it may be arranged so that food is provided by an outside food company on a contractual basis. Because of the need to provide therapeutic diets and the expense of purchasing services, it is not unusual for facilities at the skilled nursing level to have their own kitchens.

Rehabilitative services (e.g., physical therapy, speech pathology and audiology, and occupational therapy) must be provided by SNFs to patients whose physicians have written orders for such services. SNFs may arrange for such services with outside resources, or they may provide them inhouse.

SNFs are responsible for providing drugs and biologicals for their patients. They may obtain pharmaceutical services from a community or hospital pharmacy, or they may provide their own services. Inhouse pharmacies would give the nursing home the capability to compound drugs, in addition to storing drugs. When outside services are used, SNFs must, as a minimum, provide locked storage under proper temperature controls for drugs and biologicals until dispensing for administration to patients. In addition, an emergency medication kit must be kept available. The kit usually contains a wide assortment of drugs, e.g., cardiovascular drugs for arrhythmias, antihistamines, anticonvulsants, respiratory stimulants, antibiotics,



anesthetics, vasoconstrictors and vasodilators. There may also be a separate emergency medicine kit that contains certain controlled drugs (e.g., barbituates and narcotic antagonists). The contents of emergency medicine kits are likely to vary from the above lists of drugs, depending on what each nursing home's pharmacist feels is important to have available and subject to the approval of each SNF's pharmaceutical services committee.

SNFs must be able to provide laboratory and X-ray services. However, it is not necessary for a SNF to have its own services. Instead, it may utilize outside resources, e.g., hospitals, physicians offices, approved independent laboratories, or a portable X-ray supplier.

SNFs must also be able to provide dental and social services. Like the other services, there is no requirement for the SNF to provide its own dental and social services. Arrangements may be made with outside resources for these items. Particularly in the case of dental services, there is no Medicare/Medicaid reimbursement for dental care, treatment, filling, removal, or replacement of teeth or structures supporting the teeth. SNFs must only assist patients in obtaining dental services.

Medicare/Medicaid requirements covering the physical environment include fire protection equipment, emergency electrical power, and emergency water supplies among other requirements. SNFs are also required to have a written disaster plan in the event of a fire or some other internal or external disaster that allows for the care of patient and personnel casualties and their transfer to other institutions.

Providing a lesser degree of care than the skilled nursing facility but providing more than just room and board, the ICF is another facility that fits into the general category of nursing homes. Social Security certification requirements also provide some information on the services that ICFs provide.

ICF required services, including physician services, nursing services, dietetic services, specialized rehabilitative services, pharmaceutical services, laboratory and X-ray services, and social services are similar to those required for SNFs. There are differences between ICF and SNF services that should be mentioned; for example, a registered nurse or a licensed practical nurse is responsible for health services in an ICF whereas a physician is responsible for health and medical services in a SNF. Nor are there requirements that licensed nurses must be present on a 24-hour basis in an ICF as there are in a SNF. Other differences exist, but the essential difference is that ICFs are not staffed to provide the level of health and medical care found in SNFs. Because of this difference in service, it is unlikely that an ICF would be as well equipped medically as a SNF.

The difficulties in using Medicare and Medicaid certification requirements to characterize nursing homes services are obvious. The services that are provided by nursing homes depend on the patients that they accept and the physician's orders for services that accompany the patient. A hypothetical situation can be used to illustrate the problem. Suppose that a large Medicare/Medicaid certified SNF has accepted patients that require frequent blood transfusions as indicated by their physicians' orders. This facility must have the equipment to provide blood transfusions since they accepted patients with that need. A smaller SNF across town is also Medicare/Medicaid certified, but it does not have the capability to provide blood transfusions. It does not need that capability since it will not accept patients who need blood transfusions. In addition, suppose that most of the patients in both of the SNFs have orders from their physicians to receive various medications. The smaller facility obtains its drugs from a nearby community pharmacy while the larger SNF maintains its own pharmacy and full-time pharmacist. Although both of these facilities are Medicare/Medicaid

certified, there are differences that would affect their role during crisis relocation.

Another problem in using Medicare/Medicaid requirements to characterize services is that the requirements provide information on services in certified facilities only. Many nursing facilities are not certified. A survey by NCHS (1973-74 National Nursing Home Survey) looked at nursing homes by their Medicare/Medicaid certification status [Ref. 8]. Only facilities providing some level of nursing care were included in the survey (15,700 homes and approximately 1.2 million beds); homes which were entirely personal or domiciliary were excluded. Non-certified homes serve only 13 percent of all residents and are more likely to provide a lower level of skilled nursing service than the certified facilities [Ref. 8, p. 3]. Non-certified nursing homes are also likely to be smaller than certified homes; approximately 68 percent of all non-certified homes surveyed had fewer than 50 beds while the remaining homes had between 50 and 200 beds [Ref. 8, p. 3]. On the other hand, the higher the level of skilled nursing, the more likely it was that the facility was large; between 66 and 78 percent of the SNFs surveyed had 50 to 200 beds, while about 47 percent of intermediate care facilities contained 50 to 200 beds (falling between non-certified homes and those with the greatest degree of skilled nursing) [Ref. 8, p. 10]. Table IV-2 presents the distribution of nursing homes (i.e., homes that provide primarily nursing care, or personal care with some nursing) by different bed capacities and certification status. It should be noted that the information in the table was collected prior to the legislation which created the SNF category; therefore, the information is for ECFs (Medicare) and SNHs (Medicaid). However, the ECFs and the SNHs had about the same level of skilled nursing coverage [Ref. 8, p. 3].

Table IV-2. Percent Distribution of Nursing Homes by Bed Capacity,  
According to Certification Status: United States, 1973-74

	All Certifi- cation Statuses	Both Medicare and Medicaid*	Medicaid Only		
			Total	Skilled Nursing Homes**	Inter- mediate Care Facility
All bed capacities . .	100.0	100.0	100.0	100.0	100.0
Less than 25 beds . . . . .	16.5	-	11.8	7.7	15.1
25-49 beds . . . . .	24.0	12.9	29.7	21.0	36.7
50-99 beds . . . . .	35.0	42.1	36.9	38.8	35.5
100-199 beds . . . . .	20.5	36.1	18.3	27.9	11.6
200 beds or more . . . . .	4.0	7.2	3.2	5.8	-
					Not Certified
					100.0
					43.8
					24.4
					22.7
					7.3
					-

\*8 percent of these homes were for Medicare only.

\*\*35 percent of these homes were certified as both SNH and ICF.

NOTE: Figures may not add to totals due to rounding.

Source: National Center for Health Statistics, "Nursing Homes in the United States, 1973-74, National Nursing Home Survey," Vital and Health Statistics, Series 14, Number 17. Washington, D.C.: United States Government Printing Office, October 1977.



Knowing that larger SNFs are more likely to be Medicare/Medicaid certified should aid the civil preparedness planner in estimating the services that a facility can be expected to provide (nursing services, dietetic services, pharmaceutical services, X-ray and laboratory services, dental services, etc.). To determine accurately the services that a nursing home provides, the planner should consult with the nursing home administrator or with the state agency responsible for its certification and/or state licensure.

(2) National Center for Health Statistics' Classification of Nursing Homes

The National Center for Health Statistics (NCHS) collects national data on health care facilities in its Master Facility Inventory (MFI). The MFI is the most comprehensive file of inpatient health facilities available in the United States [Ref. 5, p. 329]. In the case of nursing and related homes, facilities are classified according to the primary or predominant service provided. A nursing care home is an establishment in which nursing care is the predominant function of the facility, according to the following criteria:

- . One or more registered nurses (RNs) are employed, and
  - . 50 percent or more of the patients receive nursing care
- [Ref. 5, p. 330].

Nursing care includes the provision of one or more of the following services:

- |                   |   |
|-------------------|---|
| . Nasal feeding   | . Hypodermic injection                          |
| . Catheterization | . Intravenous injection                         |
| . Irrigation      | . Temperature-pulse-respiration measurement     |
| . Oxygen therapy  | . Blood pressure measurement                    |
| . Full bed bath   | . Application of dressing or bandages           |
| . Enema           | . Bowel and bladder retraining [Ref. 5, p. 330] |

In 1973, there were 14,873 nursing care homes having a total of more than 1.1 million beds [Ref. 5, p. 365].

Personal care homes with nursing primarily provide personal care, but they also provide some nursing care. Personal care includes massages, help with baths or showers, help with dressing, help with correspondence or shopping, help with walking or getting about, and help with eating [Ref. 5, p. 330]. Less than 50 percent of the residents of personal care homes with nursing receive nursing services. Consequently, there is usually only one RN or one or more LPNs on the staff (in some instances, there may be no RNs or LPNs on the staff). However, medications and treatments are administered in conformance with the physicians' orders, self-administered medications are supervised, and three or more of the personal services (e.g., help with bathing, dressing, and eating) are routinely provided [Ref. 5, p. 330].

Homes that are primarily concerned with providing residents with personal services, but provide no nursing services, are classified by the NCHS as personal care homes without nursing. In these facilities medications and treatments are also administered in accordance with the physicians' orders; self-administered medications are supervised; and, three or more of the personal services are routinely provided to residents [Ref. 5, pp. 330-331].

A domiciliary care home provides no nursing services and routinely provides less than three of the personal services. This type of facility provides a sheltered environment for those persons who can essentially care for themselves.

Table IV-3 summarizes the data on nursing and related homes for 1971 and 1973 and shows the downward trend in the number of homes that do not provide nursing care as the predominant service. The title "Personal Care and Other Homes" is given to the combined category of personal care homes with nursing, homes without nursing, and domiciliary care homes. By adding more nursing

Table IV-3. Number of Nursing Care and Related Homes and Beds:  
United States, 1971 and 1973

Year	<u>Nursing Care Homes</u>		<u>Personal Care and Other Homes*</u>	
	Homes	Beds	Homes	Beds
1971	12,871	917,707	9,133	283,891
1973	14,873	1,107,358	6,961	220,346

\*Includes personal care homes with nursing, homes without nursing, and domiciliary care homes.

Source: National Center for Health Statistics, Nursing Homes: A County and Metropolitan Area Data Book, 1973. Washington, D.C.: U. S. Government Printing Office, 1977.

staff, or by increasing the nursing services offered, homes traditionally classified as either domiciliary care or personal care homes have been upgraded to nursing care homes [Ref. 9, 1-1]. This trend helped to increase the number of nursing care homes in 1973 by more than 2,000 over the 1971 figure while increasing the number of beds in nursing care homes by nearly 190,000 over the 1971 count.

The level of nursing care by bed capacity is shown in Table IV-4 using NCHS's Master Facility Inventory classification scheme, which was described earlier. By looking at the percentages, it is evident that the MFI classification scheme does not correspond exactly with the Medicare/Medicaid classification scheme (see Table IV-2). However, by using the MFI classification, it is possible to detect a relationship between bed capacity and level of nursing care. The larger a facility (or the greater the bed capacity), the more likely it is to be a nursing care home, and the smaller a facility is, the more likely it is to be in the category "personal care and other homes." This relationship between size of home and level of care is similar to that found with the Medicare/Medicaid classification (see Table IV-2).

Table IV-4. Percent Distribution of Nursing Care and Related Homes by Bed Capacity, United States, 1973

Bed Capacity	Total Homes	Nursing Care	Personal Care and Other Homes *
Total	100	100	100
Less than 25 beds	33.8	15.8	72.2
25-49	20.9	24.7	12.8
50-99	26.6	35.3	7.8
100-199	15.4	20.3	5.0
200 beds or more	3.4	4.0	2.2

\*Includes personal care homes with nursing, personal care homes without nursing, and domiciliary care homes.

NOTE: Figures may not add to totals due to rounding.

Source: National Center for Health Statistics, Health Resources Statistics: Health Manpower and Health Facilities, 1975. Washington, D. C.: U. S. Government Printing Office, 1976.

Table IV-5 lists the services that are potentially available in nursing and related homes. It is likely that few, if any, nursing facilities provide all of the services listed. Nevertheless, the list is useful as a guide to nursing home services and provides crisis relocation planners with a basis for developing specific plans for their community.

#### c. Geographic Distribution

Nursing homes located in host areas must be distinguished from those in risk areas. The purpose of this section is to identify the number of nursing facilities and beds in host areas.

Table IV-6 lists the nursing homes and beds by state, and host areas within each state. Data from NCHS [Ref. 9] were used for this purpose. No attempt was made to determine nursing home distribution by level of care, i.e.,



Table IV-5. Services Provided in Nursing and Related Facilities

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Examination	Blood Pressure Measurement
Nasal Feeding	Application of Dressing or Bandages
Catheterization	Bowel and Bladder Retraining
Irrigation	Massages
Oxygen Therapy	Rehabilitative Services
Full Bed Bath	Pharmaceutical Services
Enema	Laboratory and X-ray Services
Hypodermic Injection	Dental Services
Intravenous Injection	Social Services
Temperature-Pulse-Respiration Measurement	

---

nursing care as opposed to personal and domiciliary care. However, most nursing facilities (68 percent) are nursing care homes (provide some nursing care), and 83 percent of all the beds shown in the table are nursing care beds [Ref. 9].

Table IV-6. Nursing Care and Related Homes and Beds  
by State and Host Area

Location	Number of Homes	Number of Beds	Host Area Homes	Host Area Beds
United States	21,834	1,327,704	7,859	392,036
Alabama . . . . .	197	14,844	82	5,015
Alaska . . . . .	8	606	1	155
Arizona . . . . .	88	6,430	13	680
Arkansas . . . . .	211	17,952	138	10,941
California . . . . .	4,145	150,956	406	9,703
Colorado . . . . .	214	16,670	72	4,201
Connecticut . . . . .	365	23,294	0	0
Delaware . . . . .	36	2,213	7	216
District of Columbia . .	72	3,147	0	0
Florida . . . . .	360	34,956	75	5,702
Georgia . . . . .	306	25,936	178	14,118
Hawaii . . . . .	142	2,726	27	455
Idaho . . . . .	64	4,190	59	3,517
Illinois . . . . .	1,039	80,151	447	25,525
Indiana . . . . .	495	34,247	232	11,962
Iowa . . . . .	678	35,152	518	25,196
Kansas . . . . .	468	22,889	259	11,557
Kentucky . . . . .	312	18,177	188	9,399
Louisiana . . . . .	212	17,004	85	6,305
Maine . . . . .	341	9,227	150	3,126
Maryland . . . . .	204	17,755	14	772
Massachusetts . . . . .	946	53,858	12	646
Michigan . . . . .	577	48,567	159	9,621
Minnesota . . . . .	589	44,661	469	19,931
Mississippi . . . . .	143	7,886	103	5,731
Missouri . . . . .	502	33,644	189	10,354
Montana . . . . .	105	4,759	65	2,544
Nebraska . . . . .	211	17,396	146	11,411
Nevada . . . . .	41	1,482	11	319
New Hampshire . . . . .	130	5,873	46	1,758
New Jersey . . . . .	549	34,430	0	0
New Mexico . . . . .	66	3,345	34	1,943
New York . . . . .	1,083	92,888	316	14,365
North Carolina . . . . .	838	22,145	456	10,496
North Dakota . . . . .	107	6,631	53	3,174
Ohio . . . . .	1,163	65,134	471	22,075
Oklahoma . . . . .	417	29,512	247	16,648
Oregon . . . . .	317	18,306	112	7,245
Pennsylvania . . . . .	768	65,963	176	11,589
Rhode Island . . . . .	159	6,493	0	0
South Carolina . . . . .	123	8,131	123	4,439
South Dakota . . . . .	160	7,795	106	5,643

Continued

Table IV-6. Nursing Care and Related Homes and Beds  
by State and Host Area (Continued)

Location	Number of Homes	Number of Beds	Host Area Homes	Host Area Beds
Tennessee . . . . .	244	14,827	136	6,529
Texas . . . . .	967	80,510	475	32,829
Utah . . . . .	120	4,556	73	869
Vermont . . . . .	101	3,902	90	3,246
Virginia . . . . .	348	16,732	238	9,839
Washington . . . . .	382	31,147	232	6,719
West Virginia . . . . .	137	4,753	90	3,053
Wisconsin . . . . .	516	51,960	256	19,168
Wyoming . . . . .	34	1,896	24	1,307

Sources: National Center for Health Statistics, Nursing Homes: A County and Metropolitan Area Data Book, 1973. Washington, D. C.: U. S. Government Printing Office, 1977.

High Risk Areas For Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D.C.: Defense Civil Preparedness Agency, April 1975.

## 2. Veterinary Clinics and Hospitals

### a. Definition

The prevention, treatment, and alleviation of disease and injury in animals belongs to the profession of veterinary medicine. Veterinary medicine is also concerned with preventing the transmission of diseases from animals to humans. Veterinarians treat sick and injured animals, give advice regarding care and breeding of animals, and help prevent the outbreak and spread of diseases among animals. Veterinarians are also employed in regulatory and public health agencies to assist in providing safe meat and dairy products, and to help shield humans from animal diseases that affect man (zoonoses). They work in laboratory animal medicine--breeding and caring for experimental animals, and they are employed by some medical schools to teach and perform research [Ref. 5, p. 299].

Data published by NCHS [Ref. 5, p. 302] on the status of members of the American Veterinary Medical Association (AVMA) show that 78 percent of all members are in private practice, including large, small, and mixed animal practices. Approximately 20 percent of the members are in regulatory veterinary medicine, veterinary public health, military veterinary services and laboratory services (see Table IV-7). Approximately 80 percent of all veterinarians in the United States belong to the AVMA.

Of particular interest to crisis relocation planners are the private practitioners' facilities. A practicing veterinarian (private practitioner) cares for either small animals or large animals, or he/she may have a mixed practice and care for both large and small animals.

Veterinarians in private practice operate either in an animal clinic or in an animal hospital. An animal hospital, as defined by the American Animal Hospital Association (AAHA), is " . . . a facility established to supply



Table IV-7. Type of Activity of Members of the American Veterinary Medical Association: December 31, 1974

Type of Activity	Number	Percent
Total Respondents . . . . .	23,462*	100.0
Private Practice . . . . .	18,405	78.4
Large animal . . . . .	1,652	7.0
Small animal . . . . .	8,277	35.3
Mixed . . . . .	8,476	36.1
Other Practice . . . . .	4,672	19.9
Regulatory veterinary medicine . . .	784	3.3
Veterinary public health . . . . .	236	1.0
Military veterinary services . . . . .	677	2.9
Other including laboratory services .	2,975	12.7
Retired, not in practice, or status not reported . . . . .	385	1.6

\*Does not include 782 members who did not respond to AVMA.

Source: National Center for Health Statistics, Health Resources Statistics: Health Manpower and Health Facilities, 1975. Washington, D. C.: U.S. Government Printing Office, 1977.

examination, diagnostic, and prophylactic services, and medical and surgical treatment to companion animals, and equipped to provide housing and nursing care for them during illness and/or convalescence" [Ref. 10]. Animal clinics are similar to animal hospitals in that they also provide examination, diagnostic, and prophylactic services, and medical and surgical services. However, clinics operate on an outpatient basis and generally do not perform procedures that would require confinement of an animal for longer than one day. A hospital will have an area, called a "ward," which contains the cages or compartments to house the patients that must remain in the animal hospital

for care and treatment. It is the ward(s) that constitutes the true "hospital" [Ref. 11, p. 549] and, thus, distinguishes it from the clinic. However, it is not unusual for veterinarians at small clinics to have a cage or two for holding animals that need observation for several hours or even overnight.

Except where otherwise noted, clinics and hospitals will be considered together in the following discussion of services and distribution of facilities. One reason for this is that most of the services that are provided by animal hospitals are also provided by animal clinics (the obvious exception is the confinement of animals). The reason for not discussing the distribution of hospitals separately from the distribution of clinics is due to the lack of data on veterinary facilities. Information on the number of hospitals and the number of clinics has not been compiled at this time by either of the major associations concerned with veterinarians and veterinary facilities (AVMA and AAHA, respectively). Nor was information on the total number of facilities or their location available. The method used to determine the location of veterinary facilities will be presented in the subsection on the "Geographic Distribution of Veterinary Facilities."

b. Services Provided

The potential application of veterinary medicine to disaster medical care has been recognized for many years. Early health planning for disasters observed that veterinary hospitals " . . . are an important source of available medical supplies, equipment, and trained personnel and must be utilized to the utmost in the treatment of human patients" [Ref. 12, p. 11]. It is the purpose of this subsection to identify the services that veterinary hospitals and clinics normally provide so that their potential usefulness during crisis relocation can be determined.

Information on the services provided by veterinary facilities can be obtained from the Manual of Standards [Ref. 10] of the AAHA. These standards apply to hospitals and clinics that provide care for companion animals; they promote high professional standards for animal facilities that voluntarily seek membership in the Association. AAHA membership is contingent upon fulfilling the requirements in the following areas:

- |                      |                     |
|----------------------|---------------------|
| . Records            | . Library           |
| . Examination        | . Anesthesia        |
| . Pharmacy           | . Nursing care      |
| . Clinical pathology | . Emergency service |
| . Radiology          | . Housekeeping      |
| . Surgery            | . Maintenance       |
| . Dentistry          |                     |

Non-membership in the AAHA does not imply that these services are not provided. On the contrary, it is likely that most veterinary hospitals and clinics provide a majority of these services [Refs. 13 and 14]. However, the degree to which any of these services are provided will vary from one facility to another. Each of these services are discussed briefly. Information on services was obtained primarily from AAHA's Manual of Standards [10].

The AAHA requires that records be kept on each animal that is administered to by the hospital. The following information is to be recorded for each patient as appropriate:

- |                          |                                 |
|--------------------------|---------------------------------|
| . Patient identification | . Physical examination findings |
| . Complaints             | . Provisional diagnosis         |
| . Present illness        | . Clinical laboratory reports   |
| . Vaccination records    | . Radiographic reports          |
| . History                | . Consultations                 |

- . Treatment - medical and surgical . Final diagnosis
- . Drugs - prescribed or dispensed . Autopsy findings
- . Tissue examination reports

Animal hospitals and clinics commonly have at least one examination room. The AAHA recommends that there be one more examination room than there are veterinarians on duty. The examination room is used for history taking, physical examinations, inoculations, minor therapy, etc. Instruments kept in the examination room include stethoscopes, thermometers, needles and syringes, and restraint apparatus. Examination rooms usually are well lighted and large enough to accomodate (1) an examination table and chairs, (2) the veterinarian while he/she examines the animal (the AAHA suggests that each examination room be at least 70 square feet), and (3) hand washing facilities.

As with human medicine, the administration of drugs to animals is an important element in providing health care. With very few exceptions, drugs used in animal medicine are identical to those administered to humans, i.e., the generic name and composition of animal and human drugs are the same.

Because of the variety of drugs that exist for animal use, no attempt was made in this report to identify specific compounds. However, general classifications of drugs that animal hospitals and clinics can be expected to provide include: antibiotics, biologics (e.g., serums and vaccines), and anesthetics. These drugs are stored (refrigerated, if necessary) in the pharmacy section of the facility. Sterile equipment, including catheters, needles, and syringes, is also commonly stored in the pharmacy.

Pathology services are necessary for the diagnosis and treatment of diseases. Because of the need for rapid diagnosis and the chance of errors in sample interpretation by outside laboratories that are unfamiliar with species differences, pathological services are often performed inhouse. Pathological



services usually include:

- . Hematology and serology
- . Blood chemistry analysis
- . Urine analysis
- . Microbiology
- . Parasitological examination
- . Exfoliative cytology
- . Histopathology
- . Autopsies

The AAHA requires its member hospitals to provide all of the above pathology services. Most animal-care facilities that are not member hospitals still can be expected to provide many of the same services. The following equipment can be regarded as the minimum necessary for pathology services (and is required of AAHA Member Hospitals):

- . Microhematocrit
- . Microscope
- . Centrifuge
- . Urinometer or refractometer
- . Refrigerator for reagents
- . Office colorimeter
- . Incubator, 37° C

Many facilities have the laboratory and pharmacy services combined in a single room [Ref. 11, p. 548].

Radiology is a useful diagnostic tool. AAHA-approved hospitals must have radiographic equipment. The requirements specify that X-ray machines must be capable of ". . . good soft tissue radiographs on large breeds of dogs." Cones or collimators are required to restrict the size of the X-ray fields. AAHA standards also require a darkroom and processing equipment, including processing tanks, stirring rods, film hangers, view box, etc.

Surgical procedures are performed at most animal hospitals and clinics. Surgical services can be divided into preoperative preparation and surgery. Preoperative preparation is usually performed outside the room used for surgery. The surgeon, attendants, and the animal are prepared in this room for surgery in order to reduce the chance of contamination during surgery. For the animal, preoperative preparation usually includes bathing, removing

hair, and cleansing the skin with a germicidal agent. Preoperative preparation for the surgeon includes changing clothes; scrubbing; and donning gown, cap, and mask. Equipment required by the AAHA for proper preoperative preparation includes clippers, oxygen, anesthetic machine, emergency drugs, endotracheal tubes and instruments used for intubation, and a large scrub sink. The AAHA recommends having an autoclave in the preparation room to sterilize gowns, gloves, towels, laparotomy sheets, and gauze sponges. Instruments (e.g., needles, scissors, and knives) are more appropriately sterilized by dry heat and gas sterilizers.

Operating rooms should be a single-purpose room, i.e., for aseptic surgery only. Surgical rooms in AAHA accredited hospitals contain the following as a minimum:

- |                            |                             |
|----------------------------|-----------------------------|
| . Surgical lamp            | . Swab bucket               |
| . Surgical table           | . Oxygen supply             |
| . Instrument table         | . Counter and storage space |
| . Suction equipment        | . Emergency drugs           |
| . Gas anesthetic apparatus |                             |

Animal hospitals and clinics provide dental services. The AAHA defines the practice of dentistry to include diagnosis; oral prophylaxis; treatment of injuries; extractions; and treatment of diseases of deformities of the teeth, the oral cavity, and those structures associated with the teeth and oral cavity. Equipment for dental work includes: dental instruments; surgical instruments; X-ray equipment; and anesthetic equipment.

AAHA-approved hospitals must have a library containing basic veterinary medical textbooks and periodicals.

Anesthetic services are necessary to support other medical services, including surgery, dentistry, radiology, diagnosis, and treatment. Equipment

necessary to provide such services includes an anesthetic machine, endotracheal tubes, and oxygen resuscitative equipment. Anesthetic equipment and agents for topical infiltration, field block, epidural, and conduction anesthesia, and pre-anesthetic agents may also be present in animal hospitals and clinics.

Nursing care services are especially applicable to hospital inpatients (i.e., those animals confined to the hospital after medical or surgical procedures). These services include assistance in diagnostic procedures; in pre-surgical, surgical, and recovery procedures; and in custodial care. Equipment that may be associated with nursing care includes oxygen, incubators, monitoring equipment, and cleaning and disinfecting equipment and agents.

Emergency services imply that professional services are available for emergency situations at all times. AAHA standards require that, in approved hospitals, the emergency care area be separate from the surgical area. In other facilities, the examination room or the surgery area may serve as an emergency care area. Equipment for emergency care is basically the same as that which would be expected for normal operations, including oxygen, parenteral fluids, plasma substitutes, surgical supplies, resuscitative equipment, and intravenous fluids.

Housekeeping refers to the services responsible for maintaining the cleanliness of a facility and all of its equipment. Cleaning equipment and germicidal and cleaning agents are used to clean, disinfect, and sanitize patient, client, and employee areas.

Maintenance refers to the services that ensure the safety and proper functioning of a facility's plumbing, electrical system, oxygen system, telephones, heating system, etc. Common maintenance tools and equipment

(e.g., screwdrivers, pipe wrenches, light bulbs, simple carpentry tools, etc.) must be available in AAHA-approved hospitals and clinics.

The preceding discussion of facilities and services is particularly applicable to small or mixed animal practices in which animals (especially pets) are taken to a veterinarian. Because of the large number of small animals, a veterinarian's time is more efficiently utilized by having the animals come to his/her facility for care. Thus, it is feasible for a practitioner who sees many small animals to have a fixed facility in which to practice.

However, in the case of large animals (e.g., horses and cattle), it is often easier for a veterinarian to travel to the animal than for the patient to be transported to the veterinarian. For the small percentage of practitioners who care strictly for large animals (about 7 percent of the private practitioners), using a hospital or clinic may not be feasible, therefore, many large animal veterinarians practice out of their automobiles or have specially equipped mobile trucks. These veterinarians carry with them many of the instruments and agents needed for diagnosis and treatment, while larger equipment, such as sterilizers, are usually kept at a location used to house equipment (but not used as a diagnosis and treatment facility). Many of the instruments used in large animal practice are larger than those used for small animals, including items such as endotracheal tubes, syringes, and needles. Although many large animal veterinarians practice essentially out of an automobile, there are permanent facilities for large animals [Ref. 14]. These facilities provide services similar to small animal facilities, the main difference between the two being the size of some of the equipment. For example, a surgical area may be equipped for "stand-up" surgery, or it may use large, hydraulically-operated tables.



There are also veterinary specialties (e.g., surgery, toxicology, microbiology, etc.) just as there are in human medical practice. The facility from which a specialist practices may not contain the same equipment that would be expected in a non-specialist's facility. Due to the lack of data on specialty facilities and the likelihood that most practitioners are non-specialists (only about 5 percent of AVMA members belong to specialty organizations [Ref. 5, p. 299]), no attempt was made to characterize specialist services.

Table IV-8 summarizes the principal health related services provided by veterinary hospitals and clinics. Veterinary facilities are likely to vary as to the type and the extent of services actually provided.

c. Geographic Distribution

As of December 31, 1974, there was a total of 30,316 veterinarians in the U. S. (active and inactive) [Ref. 5, p. 301]. No data currently exist for the number or location of veterinary facilities. The AAHA records the location of 1,169 approved hospitals, but this is only a partial listing of the total number of facilities. Based on their mailing list, a producer of veterinary medicine and supplies estimated the total number of facilities to be between 9,000 and 10,000 [Ref. 15].

Table IV-8. Services Provided in Veterinary Hospitals and Clinics

Examination	Radiology
Pharmaceutical services	Surgery
Laboratory services	Dentistry

To estimate the number of facilities that are located in host areas, several assumptions had to be made. First, by using the percentage of AVMA veterinarians who are in private practice (78.4 percent), it was assumed that an equal proportion of the veterinarians in each state were also in private practice. (This assumption allowed an approximation of the private practice veterinarians for each state.) Next, using the 1972-1975 county-by-county listing of veterinarians from NCHS [Ref. 16] in conjunction with the list of host counties derived from High-Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes [Ref. 2], the number of private practice veterinarians located in host areas was determined for each state. Because veterinarians are often engaged in group practices, it could not be assumed that the number of host-area facilities was the same as the number of host-area private practitioners. In order to determine the number of facilities in each host area, it was assumed that there are three veterinarians per facility. It was felt that using the rate of three veterinarians per facility would provide a conservative estimate of the actual number of facilities and would be suitable for this level of research. This rate (three veterinarians per facility) was applied to the total number of private practice veterinarians in each state and to the estimated number of private practitioners in the host area of each state in order to determine the total number of veterinary facilities in each state and the number of facilities in the host area of each state. The results are presented in Table IV-9. It is recognized that this is a crude estimate of the true picture and that, in some states, there is likely to be a substantial variation from the numbers presented. However, for the purposes of this report, the estimates are adequate.

Table IV-9. Veterinary Facilities by  
State and Host Area\*

Location	Total Veterinary Facilities†	Host Area Veterinary Facilities††
United States	7,057	2,485
Alabama . . . . .	119	58
Alaska ††† . . . . .	11	1
Arizona . . . . .	74	10
Arkansas . . . . .	60	35
California . . . . .	695	60
Colorado . . . . .	174	67
Connecticut . . . . .	73	0
Delaware . . . . .	19	5
District of Columbia . .	17	0
Florida . . . . .	253	52
Georgia . . . . .	171	94
Hawaii . . . . .	20	4
Idaho . . . . .	50	40
Illinois . . . . .	341	102
Indiana . . . . .	214	78
Iowa . . . . .	288	224
Kansas . . . . .	157	69
Kentucky . . . . .	93	49
Louisiana . . . . .	88	27
Maine . . . . .	32	14
Maryland . . . . .	184	12
Massachusetts . . . . .	113	2
Michigan . . . . .	278	60
Minnesota . . . . .	200	107
Mississippi . . . . .	61	37
Missouri . . . . .	206	70
Montana . . . . .	53	31
Nebraska . . . . .	117	78
Nevada . . . . .	25	5
New Hampshire . . . . .	30	10
New Jersey . . . . .	162	49
New Mexico . . . . .	40	18
New York . . . . .	398	131
North Carolina . . . . .	116	52
North Dakota . . . . .	27	14
Ohio . . . . .	326	135
Oklahoma . . . . .	125	66
Oregon . . . . .	94	37
Pennsylvania . . . . .	263	45
Rhode Island . . . . .	14	0

(Continued)

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STUDY OF CRISIS ADMINISTRATION OF HOSPITAL PATIENTS: AND STUDY --ETC(U)  
SEP 78 D R JOHNSTON, M N LANEY, R L CHESSIN DCPA01-77-C-0241  
RTI/1532/00-04F NL

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Table IV-9. Veterinary Facilities by State and Host Area\* (Continued)

Location	Total Veterinary Facilities <sup>†</sup>	Host Area Veterinary Facilities <sup>††</sup>
South Carolina . . . . .	54	23
South Dakota . . . . .	55	43
Tennessee . . . . .	98	48
Texas . . . . .	461	130
Utah . . . . .	35	12
Vermont . . . . .	27	21
Virginia . . . . .	149	79
Washington . . . . .	166	55
West Virginia . . . . .	26	18
Wisconsin . . . . .	180	92
Wyoming . . . . .	25	16

Note: Numbers were rounded to the nearest whole number.

\*78.4 percent of all veterinarians are in private practice. It is assumed that there are an average of 3 veterinarians per facility.

<sup>†</sup>Total veterinary facilities = total active veterinarians x 78.4 percent (veterinarians in private practice) / 3 veterinarians per facility.

<sup>††</sup>Host-area veterinary facilities = total host-area veterinarians x 78.4 percent (veterinarians in private practice) / 3 veterinarians per facility.

<sup>†††</sup> For Alaska, veterinarians were reported by jurisdictional division instead of by county.

Information adapted from:

National Center for Health Statistics, Health Resources Statistics: Health Manpower and Health Facilities, 1975. Washington, D. C.: U. S. Government Printing Office, 1976.

High-Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D. C.: Defense Civil Preparedness Agency, 1975.

Health Manpower: A County and Metropolitan Area Data Book, 1972-1975. National Center for Health Statistics, Washington, D. C.: U. S. Government Printing Office, 1976.

### 3. Chiropractic Facilities

#### a. Definition

Before attempting to define a chiropractic facility, it may be useful to define chiropractic and chiropractor. According to the American Chiropractic Association [Ref. 17] chiropractic can be defined as:

"Chiropractic is based on the premise that the relationship between structure and function in the human body is a significant health factor and that such relationship between the spinal column and the nervous system are the most significant, since the normal transmission and expression of nerve energy are essential to the restoration and maintenance of health. Chiropractic is that science and art which utilizes the inherent recuperative powers of the body and the relationship between the musculoskeletal structures and functions of the body, particularly of the spinal column and the nervous system, in the restoration and maintenance of health."

The Department of Health, Education, and Welfare's publication, Health Resources Statistics [Ref. 5] offers the following definition:

"Chiropractic is a system of mechanical therapeutics based on the principle that the nervous system largely determines the state of health and that any interference with this system impairs normal functions and lowers the body's resistance to disease. Chiropractors may provide obstetrical care in States that do not specifically forbid it. Chiropractic treatment consists primarily of the chiropractic "adjustment" (or manipulation) of parts of the body, especially the spinal column. Some chiropractors also use physiotherapy and nutritional supplementation; radiology is used for diagnosis only. They do not use drugs or surgery."

A chiropractor, then is one who practices this branch of the healing arts.

Since the typical chiropractor is engaged in solo practice [Ref. 17], a chiropractic facility is defined for the purpose of this analysis as the office(s) of one chiropractor. Some indication of the size of such facilities is given in a study of California chiropractors [Ref. 18] which found that 46 percent of the practitioners in that state used seven or more rooms in performing their professional services. The facilities included some or all

of the following: patient waiting rooms, private offices for the chiropractor, adjustment rooms, treatment rooms, X-ray rooms, etc.

b. Services Provided

Chiropractic services fall into categories as follows [Ref.19]:

- . Adjustment to achieve normal nerve functions
- . Nutritional and dietary guidance
- . Physical therapy, including massage, water, heat, light, and electricity
- . Counseling on psychosomatic problems
- . Regulated exercise, use of herbs, and colonic irrigation

As suggested in the second definition of chiropractic offered above, not all chiropractors provide all of the services listed immediately above.

In the conduct of his/her practice, the chiropractor makes use of a number of diagnostic aids, including:

- . X-ray equipment (for spinal X-ray)
- . Skin temperature recording instruments
- . General equipment (e.g., otoscope, ophthalmoscope, stethoscope, sphygmomanometer, and reflex hammer)
- . Laboratory tests [Ref. 20]

The only data available on the extent of diagnostic equipment are for X-ray machines in California in 1960 when 23 percent of the chiropractors had such devices [Ref. 18].

c. Geographic Distribution

In 1974 about 27,300 chiropractors were licensed to practice, with perhaps 16,600 in active practice [Ref.5, p. 51]. As of June 1974, chiropractors were licensed in all states and the District of Columbia. Nearly 38 percent of the active practitioners were located in five states; 12 percent



were in California, 8 percent in New York, 6 percent in Texas, 6 percent in Missouri, and 6 percent in Pennsylvania.

The distribution of chiropractors by state is shown in Table IV-10, which also includes estimates of host area practitioners by state. Nationally, it appears that between five and six thousand practitioners are located in host areas. This estimate assumes that chiropractors are uniformly distributed throughout the population, which may not be strictly correct. If it is further assumed that host area practitioners are engaged in solo practice, the estimated number of office facilities is the same. It is believed that this estimate is satisfactory for the purpose of this research.

#### 4. Osteopathic Facilities

##### a. Definition

Like medicine, osteopathy is the science and art of dealing with the prevention, cure, and alleviation of disease. Osteopaths diagnose diseases, treat people who are ill, and in most states use surgery, drugs, and other accepted methods of medical care [Ref. 5, p. 161]. Two types of osteopathic facilities are considered in this report: (1) the offices of osteopathic physicians (D.O.s), and (2) osteopathic hospitals. Today, of course, osteopathic hospitals in most states are operated as general medical-surgical hospitals.

##### b. Services Provided

###### (1) Osteopaths' Offices

The modern osteopath, like the M.D. counterpart, may be engaged either in the general practice of medicine or in a specialty practice. The services provided by osteopaths generally consist of diagnosis, outpatient treatment, counseling, referral, etc. Table IV-11 shows the services commonly provided by office-based osteopaths, excluding osteopaths whose specialties



Table IV-10. Distribution of Active Chiropractors by State  
and Host Area: April 1974

Location	Total	Host Area***
United States . . . . .	17,559	5,728
Alabama . . . . .	260	133
Alaska . . . . .	18	8
Arizona . . . . .	248	62
Arkansas . . . . .	128	83
California . . . . .	2,094*	229
Colorado . . . . .	225	61
Connecticut . . . . .	117	3
Delaware . . . . .	18	3
District of Columbia . . . . .	5	0
Florida . . . . .	799	224
Georgia . . . . .	250	129
Hawaii . . . . .	25	6
Idaho . . . . .	58	49
Illinois . . . . .	650	141
Indiana . . . . .	295	129
Iowa . . . . .	595	390
Kansas . . . . .	559	256
Kentucky . . . . .	405	237
Louisiana . . . . .	150**	64
Maine . . . . .	35	23
Maryland . . . . .	173	13
Massachusetts . . . . .	236	10
Michigan . . . . .	825	202
Minnesota . . . . .	465	214
Mississippi . . . . .	200	152
Missouri . . . . .	1,001	325
Montana . . . . .	95	52
Nebraska . . . . .	73	40
Nevada . . . . .	48	10
New Hampshire . . . . .	175	80
New Jersey . . . . .	590	52
New Mexico . . . . .	115	69
New York . . . . .	1,492	274
North Carolina . . . . .	244	156
North Dakota . . . . .	68	37
Ohio . . . . .	550	154
Oklahoma . . . . .	331	173
Oregon . . . . .	191	82
Pennsylvania . . . . .	986	286
Rhode Island . . . . .	38*	-
South Carolina . . . . .	197	124
South Dakota . . . . .	110	87
Tennessee . . . . .	132	73
Texas . . . . .	1,134	355
Utah . . . . .	75*	18

Continued

Table IV-10. Distribution of Active Chiropractors by State  
and Host Area: April 1974 (Continued)

Location	Total	Host Area***
United States . . . . .	17,559	5,728
Vermont . . . . .	40	33
Virginia . . . . .	75*	30
Washington . . . . .	400	119
West Virginia . . . . .	42	26
Wisconsin . . . . .	480	218
Wyoming . . . . .	44	34

\* Previous figure used in absence of sufficient information on which to base revision.

\*\* Estimated.

\*\*\* The number of host area chiropractors in a state was estimated as follows: the risk area population of a state was subtracted from the total state population to give a state host area population; the host area population was divided by the total state population to give a ratio; the ratio thus obtained was multiplied by the number of chiropractors in the state to obtain an estimate of host area practitioners.

Sources: National Center for Health Statistics, Health Resources Statistics: Health Manpower and Health Facilities, 1975. Washington, D. C.: U. S. Government Printing Office, 1976.

High Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D. C.: Defense Civil Preparedness Agency, April 1975.

Table IV-11. Services Provided by Office-Based Osteopaths

Physical examination	Endoscopy
Clinical laboratory	Injections
X-Ray	Immunization and desensitization
Blood pressure measurement	Surgery
Electrocardiogram	Physiotherapy
Hearing and vision tests	Psychotherapy

Source: Division of Health Resources Utilization Statistics, "Office Visits to Doctors of Osteopathy: National Ambulatory Medical Care Survey, United States, 1975," Advance Data From Vital and Health Statistics. Hyattsville, Maryland: Department of Health, Education, and Welfare, March 28, 1978.

are anesthesiology, pathology, and radiology, and osteopaths in Federal services [Ref. 21]. As with all office-based physicians, the most common diagnostic procedures performed were the limited examination, blood pressure check, and laboratory test; the therapeutic procedures provided by D.O.s most often were treatment by prescription drug, injection, and manipulative therapy [Ref. 21]. His/her office, then, may be expected to contain those items of diagnostic and therapeutic equipment appropriate to the type of practice being conducted.

## (2) Osteopathic Hospitals

As noted above, osteopathic hospitals are general hospitals that provide medical and surgical services. The 1978 Directory, American Osteopathic Hospital Association [Ref. 22] lists the services provided in osteopathic hospitals; that listing is presented here as Table IV-12. It is emphasized that few, if any, osteopathic hospitals provide all of the services listed in Table IV-12. Nevertheless, the extent of services listed in the table does suggest that osteopathic hospitals offer

Table IV-12. Services Provided in Osteopathic Hospitals

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Postoperative recovery room	Psychiatric emergency services
Intensive care unit (cardiac care only)	Psychiatric foster and/or home care
Intensive care unit (mixed)	Psychiatric consultation and education services
Open-heart surgery facilities	Clinical psychology services
Pharmacy W/FT registered pharmacist	Organized outpatient department
Pharmacy W/PT registered pharmacist	Outpatient surgery
X-ray therapy	Emergency department
Cobalt therapy	Social work department
Radium therapy	Family planning service
Diagnostic radioisotope facility	Genetic counseling service
Therapeutic radioisotope facility	Abortion service (inpatient)
Histopathology laboratory	Abortion service (outpatient)
Organ bank	Home care department or program
Blood bank	Dental services
Electroencephalography	Podiatric services
Respiratory therapy department	Speech pathology services
Premature nursery	Hospital auxiliary
Self-care unit	Volunteer services department
Skilled nursing or long-term care unit	Patient representative services
Hemodialysis (inpatient)	Alcoholism/chemical dependency outpatient services
Hemodialysis (outpatient)	Alcoholism/chemical dependency inpatient unit
Burn care unit	TB and other respiratory diseases unit
Physical therapy department	Neonatal intensive care unit
Occupational therapy department	OMT department or service
Rehabilitation inpatient unit	
Rehabilitation outpatient services	
Psychiatric inpatient unit	
Psychiatric outpatient services	
Psychiatric partial hospitalization plan	

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Source: 1978 Directory, American Osteopathic Hospital Association. Park Ridge, Illinois: American Osteopathic Hospital Association, 1978.



most of the services provided by non-osteopathic general hospitals. The 1978 Directory identifies the services provided by each osteopathic hospital listed.

c. Geographic Distribution

The distribution of the 9,385 active, non-federal osteopaths in 1971 is shown in Table IV-13 by state and host area. In 1971, 7,146 osteopaths were in private practice; 5,248 (73.4 percent) were in solo practice and the remaining 1,898 practitioners (26.6 percent) were engaged in partnership, group, or other practices [Ref. 5, p. 172].

(1) Osteopaths' Offices

An osteopathic office (facility) includes a facility utilized by one osteopath (solo) or by several osteopaths (group, partnership, or other). A lower bound estimate of osteopaths' offices in host areas is given by multiplying the host area estimates (Table IV-13) by 0.734, the fraction of osteopaths in solo practice. For the United States this is

$$2,881 \text{ osteopaths} \times 0.734 = 2,115 \text{ offices.}$$

If it is assumed that the average number of osteopaths in partnership, group, and other practice is three (3), then the number of offices (facilities) is  $(\text{no. of host area practitioners} \times 0.266) \div 3 \text{ practitioners/office} = \text{number of offices}$ .

For the United States this is

$$(2,881 \text{ osteopaths} \times 0.266) \div 3 \text{ osteopaths/offices} = 255 \text{ offices.}$$

Thus, for the United States, it is estimated that there are from 2,115 to 2,370  $(2,115 + 255)$  such facilities in host areas.

(2) Osteopathic Hospitals

Osteopathic hospitals and beds by state and risk area are shown in Table IV-14. Of the nearly 25,000 total osteopathic hospital beds in the United States, only about 3,400 are located in host areas.

Table IV-13. Distribution of Active Non-Federal Osteopaths  
by State and Host Area: 1971

Location	Total	Host Area
United States . . . . .	9,385*	2,881
Alabama . . . . .		
Alaska . . . . .	1	-
Arizona . . . . .	256	64
Arkansas . . . . .	10	7
California . . . . .	96	11
Colorado . . . . .	195	53
Connecticut . . . . .	34	1
Delaware . . . . .	21	3
District of Columbia . . . . .	4	0
Florida . . . . .	469	131
Georgia . . . . .	54	28
Hawaii . . . . .	15	3
Idaho . . . . .	20	17
Illinois . . . . .	233	51
Indiana . . . . .	124	55
Iowa . . . . .	288	187
Kansas . . . . .	131	60
Kentucky . . . . .	25	15
Louisiana . . . . .	9	4
Maine . . . . .	148	99
Maryland . . . . .	15	1
Massachusetts . . . . .	116	5
Michigan . . . . .	1,631	391
Minnesota . . . . .	39	18
Mississippi . . . . .	-	-
Missouri . . . . .	798	263
Montana . . . . .	16	9
Nebraska . . . . .	16	9
Nevada . . . . .	13	3
New Hampshire . . . . .	14	6
New Jersey . . . . .	565	51
New Mexico . . . . .	80	48
New York . . . . .	370	67
North Carolina . . . . .	17	11
North Dakota . . . . .	6	3
Ohio . . . . .	841	235
Oklahoma . . . . .	301	157
Oregon . . . . .	125	54
Pennsylvania . . . . .	1,177	341
Rhode Island . . . . .	65	0
South Carolina . . . . .	4	3
South Dakota . . . . .	23	18

Continued

Table IV-13. Distribution of Active Non-Federal Osteopaths  
by State and Host Area: 1971 (Continued)

Location	Total	Host Area
Tennessee . . . . .	44	24
Texas . . . . .	597	185
Utah . . . . .	11	3
Vermont . . . . .	24	19
Virginia . . . . .	26	10
Washington . . . . .	114	34
West Virginia . . . . .	64	58
Wisconsin . . . . .	134	62
Wyoming . . . . .	5	4

\*Excludes 47 physicians (D.O.) in U.S. possessions and foreign countries.

Sources: National Center for Health Statistics, Health Resources Statistics: Health Manpower and Health Facilities, 1975, Washington, D. C.: U. S. Government Printing Office, 1976.

High Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D. C.: Defense Civil Preparedness Agency, April 1975.

Table IV-14. Distribution of Osteopathic Hospitals  
by State and Host Area: 1978

Location	Total		Host Area	
	Hospitals	Beds	Hospitals	Beds
United States	198	24,965	53	3,418
Arizona . . . . .	5	738	1	34
California . . . . .	5	529	0	0
Colorado . . . . .	5	651	1	78
Delaware . . . . .	1	97	0	0
Florida . . . . .	16	2,432	2	367
Georgia . . . . .	1	234	0	0
Illinois . . . . .	3	544	1	46
Indiana . . . . .	3	255	1	35
Iowa . . . . .	3	413	1	17
Kansas . . . . .	2	154	0	0
Maine . . . . .	3	318	1	78
Massachusetts . . . . .	1	80	0	0
Michigan . . . . .	30	4,965	8	467
Missouri . . . . .	23	2,296	14	970
New Jersey . . . . .	7	1,160	0	0
New Mexico . . . . .	2	137	0	0
New York . . . . .	3	430	0	0
Ohio . . . . .	16	2,954	3	251
Oklahoma . . . . .	6	745	3	77
Oregon . . . . .	5	214	1	28
Pennsylvania . . . . .	17	2,553	6	648
Rhode Island . . . . .	1	79	0	0
South Dakota . . . . .	1	37	0	0
Tennessee . . . . .	1	21	0	0
Texas . . . . .	28	2,245	8	251
Washington . . . . .	4	204	2	71
West Virginia . . . . .	3	67	0	0
Wisconsin . . . . .	3	413	0	0

Source: 1978 Directory, American Osteopathic Hospital Association. Park Ridge, Illinois: American Osteopathic Hospital Association, 1978.



## 5. Dental Facilities

### a. Definition

"The practice of dentistry involves the art and science of preventing, diagnosing, and correcting disease and injury to the teeth and supporting oral structures" [Ref. 5, p. 75]. A dental facility then provides the equipment and space for a dentist to perform his craft. Dental offices vary somewhat depending upon the number of dentists, auxiliary personnel, and type of practice.

Dentists are a relatively homogenous group. Besides being overwhelmingly white and male, a great majority of dentists are self employed (86 percent) and in individual practice (79 percent) [Ref. 23, p. 82]. Therefore, the typical dental office will house one dentist providing general dental care to patients. Approximately ten percent of all active dentists are specialists, and this number is growing rapidly [Ref. 5, p. 76].

The number of auxiliary personnel (dental hygienists and dental assistants) may influence the size (number of rooms) of dental facilities. In the past 15 years, there has been a marked increase in the number of auxiliary personnel. Among dentists in general practice, approximately 85 percent have one dental assistant or more [Ref. 5, p. 78]. The ratio of dental hygienists to practicing dentists has also increased to approximately one to five (1973) [Ref. 5, p. 77].

### b. Services Provided

A dentist's office commonly has two rooms for the dentist and another one for the hygienist, where there is a hygienist. There will also be a dark room to develop X-rays and a room for sterilization equipment. [Ref. 24]

Specialists, such as pedodontists, oral surgeons, and orthodontists, have their own requirements for their practice, and this is reflected in the

facility. Orthodontists, who make up the largest block of specialists, are involved in changing the position of teeth. They generally have few rooms or chairs for the patients to be sitting in while work is performed. They have X-ray equipment and developers in their offices and usually rely on cold sterilization for "clean" tools, since gum and teeth surfaces are rarely broken. Thus, orthodontic offices frequently do not have autoclaves for sterilization.

Oral surgeons usually have two rooms for operations. They rarely have a hygienist. An office will contain X-ray equipment and a developer, as well as an autoclave for sterilization.

Pedodontists, children's dentists, often have more chairs for patients to sit in, but not necessarily more rooms. Pedodontic offices would also contain X-ray and sterilization equipment.

c. Geographic Distribution

At the end of 1973, there were an estimated 107,300 active dentists in the U.S.; all but about 6,500 were civilian dentists [Ref. 5, p. 80]. The distribution of active dentists runs from a low of 26 per 100,000 civilians in Mississippi to a high of 65 per 100,000 population in Connecticut. The District of Columbia has a higher rate, with 77 per 100,000 [Ref. 5, p. 81]. Also in 1973, there were approximately 14,500 inactive dentists [Ref. 5, p. 75], some of whom may maintain unused dental offices that may be at least partially equipped. However, no information was available that permitted an estimation of the number of unoccupied dental offices.

Table IV-15 gives the distribution of dentists by state and includes estimates of host area practitioners by state. For the nation, about 30 percent of active dentists are located in host areas. As with chiropractors, estimates were made using the assumption that dentists are uniformly distributed throughout the population. Finally, assuming that the typical

Table IV-15. Distribution of Active Civilian Dentists by  
State and Host Area: December 31, 1973

Location	Total	Host Area*
United States . . . . .	100,780	28,177
Alabama . . . . .	1,021	521
Alaska . . . . .	107	46
Arizona . . . . .	767	192
Arkansas . . . . .	624	406
California . . . . .	11,995	1,319
Colorado . . . . .	1,189	321
Connecticut . . . . .	1,975	59
Delaware . . . . .	224	34
District of Columbia . . . . .	569	0
Florida . . . . .	3,065	858
Georgia . . . . .	1,543	802
Hawaii . . . . .	463	102
Idaho . . . . .	333	280
Illinois . . . . .	5,597	1,231
Indiana . . . . .	2,046	900
Iowa . . . . .	1,305	848
Kansas . . . . .	977	449
Kentucky . . . . .	1,175	682
Louisiana . . . . .	1,380	593
Maine . . . . .	375	251
Maryland . . . . .	1,801	144
Massachusetts . . . . .	3,438	138
Michigan . . . . .	4,255	1,021
Minnesota . . . . .	2,234	1,028
Mississippi . . . . .	585	445
Missouri . . . . .	1,956	626
Montana . . . . .	330	182
Nebraska . . . . .	830	174
Nevada . . . . .	231	51
New Hampshire . . . . .	361	166
New Jersey . . . . .	4,117	371
New Mexico . . . . .	339	203
New York . . . . .	13,196	2,375
North Carolina . . . . .	1,576	1,009
North Dakota . . . . .	233	96
Ohio . . . . .	4,691	1,313
Oklahoma . . . . .	970	504
Oregon . . . . .	1,373	590
Pennsylvania . . . . .	6,462	1,874
Rhode Island . . . . .	429	0
South Carolina . . . . .	746	470

Continued

Table VI-15. Distribution of Active Civilian Dentists by  
State and Host Area: December 31, 1973 (Continued)

Location	Total	Host Area*
South Dakota . . . . .	240	190
Tennessee . . . . .	1,562	765
Texas . . . . .	4,241	1,315
Utah . . . . .	645	155
Vermont . . . . .	184	149
Virginia . . . . .	1,902	761
Washington . . . . .	2,076	623
West Virginia . . . . .	590	366
Wisconsin . . . . .	2,295	1,056
Wyoming . . . . .	162	123

\*The number of host area dentists in each state was estimated as follows: the risk area population of a state was subtracted from the total state population to give a state host area population; the host area population was divided by the total state population to give a ratio; and the ratio thus obtained was multiplied by the number of dentists in the state to obtain an estimate of host area practitioners.

Sources: National Center for Health Statistics, Health Resources Statistics: Health Manpower and Health Facilities, 1975. Washington, D.C.: U.S. Government Printing Office, 1976.

High Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D. C.: Defense Civil Preparedness Agency, April 1975.



host area dental practitioner is engaged in solo practice, the estimated number of host area dental facilities is of the same order.

### C. Application in Crisis Relocation

Having characterized allied professional medical facilities, it is appropriate to consider how they can be applied to meet the health needs of a relocated population. In order to determine their potential application, it is necessary to consider the probable availability of allied medical facilities during crisis relocation, especially in host areas. This section briefly considers the probable availability of each facility type and their potential application. As an introduction to the discussion of the availability and application of allied medical facilities to crisis relocation, a discussion of the health problems of crisis relocation is presented.

#### 1. Health Problems During Crisis Relocation

As noted earlier, the health problems of a relocated population are the same ones that are usually present in a population under normal circumstances, plus some problems attributable to relocation itself [Ref. 1, Vol. I]. It is expected, then, that some members of a relocated population will experience a number of acute and chronic conditions that may require the attention of health professionals. Additionally, the stress of relocation may result in some premature births, emotional crises, and worsening of certain metabolic disorders. If housing is crowded and/or sanitary controls break down, then outbreaks of communicable diseases may occur. In general, however, the major health need during crisis relocation is expected to be primary care.

Meeting the primary care as well as other needs may be difficult considering the lack of medical facilities and health personnel in many, if

not most, host areas. Consider, for example, the situation for people relocating from the Colorado Springs - El Paso County risk area to Fremont County, Colorado, one of the host areas. Assuming 38,500 people are relocated to Fremont County, the total population of the county will swell from 21,942 to 60,442. The shortages of health resources to be expected during relocation were estimated as follows: 37 physicians (and offices), 25 dentists (and offices), and 206 beds. Moreover, the situation in Fremont County is thought to be representative of many host areas. Remedying these shortages is a major problem confronting the planner.

One approach to solving the medical facilities shortage problem is to identify other facilities that could be pressed into service during crisis relocation. This section considers the use of allied professional medical facilities, including nursing homes, veterinary clinics and hospitals, chiropractic facilities, osteopathic facilities and dental facilities in meeting the needs of crisis relocation. Note that osteopathic, chiropractic, and dental facilities will almost certainly continue to provide primary care services. However, increased patient loads should be anticipated. The discussion that follows concentrates on how such facilities could be utilized during crisis relocation without addressing the means of overcoming many legal and professional obstacles to such utilization.

## 2. Application of Allied Medical Facilities to Primary Care

### a. Nursing Homes

#### (1) Availability During Relocation

The total number of nursing care and related homes and beds in host areas by state was presented in Table IV-6. An estimated one-third of all beds are in host areas. Generally, host area beds are distributed proportionally to host area populations. Therefore, northeastern states have the lowest percentage of beds in host areas. The exception is

Vermont, the most rural state in the country, which has 83 percent of its beds and population in non-risk areas. States in the Great Plains area (Nebraska, Iowa, Kansas, Oklahoma, and South Dakota), the Rocky Mountains (New Mexico, Idaho, Montana, and Wyoming), and the South (Arkansas, Georgia, Kentucky, Mississippi, South Carolina, Virginia, and West Virginia) all have more than 50 percent of total nursing home beds in host areas. It is important to reiterate that host-area bed estimates are conservative since counties that contained both risk and non-risk areas as shown in DCPA's High Risk Areas [Ref. 2] were treated as risk areas. In New Jersey, for example, a fraction of every county is shown to be in a high risk area resulting in all counties being classified as risk areas. Therefore, there are no host area beds listed in Table IV-6 but, in fact, there are nursing homes located in non-risk areas of New Jersey.

Another important factor in the availability of nursing homes and beds is their occupancy rate. Nursing care and related homes typically have an occupancy rate of over 90 percent, thus limiting their availability in the event of crisis relocation. Discharging residents to the care of families or friends would increase the number of available beds. The extent to which nursing homes can discharge patients is limited by 1) the condition of patients, and 2) the existence of families, friends, or other responsible parties in whose care patients can be discharged. It will be necessary to evaluate nursing facilities individually due to the variation among such facilities.

## (2) Potential Application

Nursing homes are typically equipped and staffed to provide nursing services and limited medical care. It is likely that, if provided with additional medical supplies and personnel, nursing facilities could supplement inpatient hospital services. Where located in close



proximity to a hospital, a nursing home could potentially function as an inpatient wing of the hospital. The application of nursing facilities in crisis relocation depends, however, on the ability to create additional beds by discharging able patients. The problems with discharging patients were discussed immediately above.

Where nursing homes are unable to free-up beds, an alternative application would be to set aside a room(s) that could be used as an outpatient clinic. Additional medical personnel and equipment would probably be required to establish such a clinic.

b. Veterinary Clinics and Hospitals

(1) Availability During Relocation

Veterinarians (and veterinary facilities) are distributed more in proportion to the animal population than to the human population. For example, Virginia has approximately sixty-five percent of its veterinarians located in host areas, but only forty percent of the population resides in host counties. Presumably, the veterinarians and their facilities are located according to their patients' locations. Table IV-9 gives a breakdown by state of host-area facilities. Approximately 35 percent of the estimated total facilities are in host areas.

During crisis relocation, it is likely that nonessential animal care services will be suspended in order to increase the availability of veterinary facilities to provide human care services. An issue that has not been adequately addressed which may affect the availability of veterinary facilities has to do with the pet population of risk area residents during crisis relocation. If pets accompany their owners to host areas, the demand for veterinary services and facilities may increase.

(2) Potential Application

Veterinary clinics and hospitals provide a range of services adaptable to human care, including examination, radiology, surgery,



and pharmacy. They are not equipped to provide inpatient care for humans, however. Thus, an obvious application for veterinary facilities would be as an outpatient clinic to provide primary care. Veterinary mobile units are well equipped and could be used to provide limited health services in host areas. Because the major health and medical problem of crisis relocation is likely to be one of primary care, it would be desirable for veterinarians to share their facility with physicians or nurse practitioners to provide such care for human patients. However, in the event of mass casualties, veterinarians may be called upon to provide emergency services, e.g., reducing fractures and controlling hemorrhages.

c. Chiropractic Facilities

(1) Availability During Relocation

The distribution of chiropractors (and chiropractor offices) by state and by host area is shown in Table IV-10. Approximately one third of all chiropractic facilities are in host areas.

Since the host area chiropractors presumably will continue to treat their regular patients during crisis relocation, the availability of their offices for other purposes will be somewhat limited. The primary limitation in using chiropractor facilities probably will be the size of the practice and, in particular, the number of patients seen each day.

(2) Potential Application

An increased need for chiropractic services, in addition to other primary care services, is anticipated, since many people, unaccustomed to strenuous physical activity, may suffer strains and sprains of the lower back and extremities while participating in the construction of expedient shelter in host areas. These injuries are in addition to the fractures, dislocations, sprains, and strains that would have occurred anyway in the relocated populations.

While availability may be limited, chiropractor facilities do offer some potential in the provision of primary care during crisis relocation. Two obvious applications are: (1) using the offices as outpatient clinics to provide primary care, and (2) using the offices as a diagnostic X-ray facilities. With regard to the former application, if a chiropractor was willing to share his office with another chiropractor, a physician, or a nurse clinician, then an increased number of patients could be seen on an outpatient basis. This sharing could involve using the facility either during normal office hours or at other times. Cancellation of nonessential patient appointments would also increase the availability of chiropractic offices.

As noted in Section B of this chapter, a significant number of chiropractors have X-ray machines in their offices. This suggests the additional possibility of using chiropractor offices as X-ray departments during crisis relocation. The feasibility of using chiropractors' offices for applications other than their normal primary care role, will depend on such things as location with respect to a hospital, relationships between the chiropractor concerned and local medical practitioners, legal authorities, etc.

d. Osteopathic Facilities

(1) Availability During Relocation

Approximately 31 percent of all osteopathic offices are in host areas (see Table IV-13), while 27 percent of the osteopathic hospitals and 14 percent of the beds are in host areas (see Table IV-14).

The availability of osteopathic offices to provide services to a relocated population will be somewhat limited by the size of the practice and the osteopath's normal patient load. Except in the few states where osteopaths are restricted in their practice, osteopathic hospitals will be

actively involved in all phases of providing primary health care. Indeed, earlier work [Ref. 1, Vols. I and II] considered osteopaths as primary care physicians and treated osteopathic hospitals as general medical-surgical facilities. Thus, osteopaths and osteopathic hospitals are not an additional resource in the sense that chiropractors' offices are.

(2) Potential Application

During crisis relocation osteopaths will provide outpatient care in their offices and osteopathic hospitals will provide inpatient care. Measures to increase the patient handling capability, such as cancelling nonessential patient appointments, foregoing elective procedures, sharing offices with other physicians, longer office hours, discharging selected patients from osteopathic hospitals, and increasing hospital bed capacity by putting beds in corridors would be appropriate.

e. Dental Facilities

(1) Availability During Relocation

Dentists are distributed in proportion to the population with the result that 28 percent of all dentists are in host areas (see Table IV-15). The availability of dental offices during crisis relocation will be limited by the size of the practices and the normal patient loads.

(2) Potential Application

As a result of earlier work [Ref. 1, Vol. I], it was shown that there will be a number of dental disorders among the relocated population requiring professional attention. Thus, dentists will be actively involved in continuing primary dental care in their host-communities.

In order to meet the increased demand for dental services, dentists can cancel appointments for preventive and elective dental procedures, increase their operating hours, and share their facility with another dentist.

Like other allied medical facilities, dental facilities are most effective when used for the purpose for which they were designed and built. However, under circumstances of greatly increased demands for medical care, dental facilities could be staffed and equipped to help meet such demands. Staffed by physicians and/or nurses, and with the assistance of dentists, dental facilities could be operated as medical outpatient clinics. An emergency role for dentists was recognized by the Public Health Service in their Health Mobilization Series [Ref. 25]. In planning for disasters dentists should prepare themselves to, in addition to their usual dentistry role, perform: surgical repair of lacerations; treatment of fractures and wounds; control of hemorrhage; resuscitation, including the provision of an adequate airway; psychological management of patients; identification of fatalities by dental examinations; and the prescription of drugs for emergency medical care. The emergency roles of other health professionals are discussed in Refs. 26, 27, and 28.

### 3. Conclusions

The use of allied professional medical facilities can increase the ability of host areas to cope with the additional health problems brought about by relocated populations. Nursing homes can be used to augment inpatient hospital services, subject to their ability to create additional beds by discharging able patients to families or friends. The extent to which patients can be discharged is a function of 1) their condition and 2) the presence of someone to assume responsibility for them upon discharge. These two factors will vary among nursing homes and should be evaluated on a facility-by-facility basis. In some instances, it may be that nursing facilities will be very limited in the medical support they can provide.

Veterinary facilities offer many services adaptable to human care and could serve as outpatient clinics. In addition, many veterinarians have



mobile veterinary units that could serve areas that do not have ready access to medical facilities.

Osteopathic, chiropractic, and dental facilities are already involved in the delivery of primary health care. For the most part, they would continue to provide their usual services, but for an increased number of patients. Thus, these facilities will not be available to supplement the existing primary care facilities of host areas.

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D. Development of Guidance and Incorporation of Allied Medical Facilities Into Existing Crisis Relocation Plans

This section discusses the approach taken in developing guidance and prototype plans to apply allied medical facilities in crisis relocation. The guidance suggests alternatives for the planner's consideration in using allied medical facilities in support of crisis relocation health and medical (h/m) services. Prototype plans were developed that incorporate allied medical facilities into an existing crisis relocation plan. This work was accomplished in two stages:

- . The preparation of the guidance and prototype plans, and
- . The testing and revising of the guidance and prototype plans.

1. Preparation of Guidance and Prototype Plans

The guidance and the prototype plans for allied medical facilities are modeled after existing h/m guidance and prototype plans. In fact, the guidance and the prototype plans presented in this chapter were prepared as appendixes to "Health and Medical Guidance for Crisis Relocation Planners" and the "Fremont County Crisis Relocation Plan, Annex D, Health and Medical Services", respectively.\*

Information from Sections B and C of this chapter on the characteristics and possible CRP applications of allied medical facilities, was used to develop the guidance. The guidance was prepared in the crisis relocation time sequence (i.e., internal readiness, mobilization, and evacuation) and it is applicable to evacuating, host, and state jurisdictions. An effort was made to avoid dictating strict procedures that would confine the applicability of the guidance.

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\*Laney, M. N., P. F. Giles, D. R. Johnston, and E. L. Hill, Management of Medical Problems Resulting From Population Relocation, Vol. II. Research Triangle Park, North Carolina: Research Triangle Institute, May 1976.

After developing the guidance, prototype plans were prepared to incorporate allied medical facilities into an existing crisis relocation plan. Because shortages of h/m resources are likely to occur principally in host areas in a crisis relocation situation, prototype plans for the utilization of allied medical facilities were developed for a host county where additional h/m support will be needed. Fremont County, Colorado, a host area for Colorado Springs, was the focus of earlier crisis relocation planning efforts and is the location considered in this chapter. A visit to Fremont County was made to collect data; to enlist the support of the acting civil preparedness coordinator, Carol McNew; and to obtain the names of local h/m professionals who would be willing to assist later in the testing of guidance and prototype plans.

## 2. Testing and Revisions

During another visit to Colorado in May 1978, RTI personnel presented the draft guidance and prototype plans to a group of selected Fremont County health professionals and Colorado state civil preparedness officials for their critical evaluation. A number of useful suggestions were made by the evaluators. These suggestions, along with additional observations made by the project team, were incorporated into the guidance and prototype plans.

E. Appendix 5, Allied Medical Facilities, Health and Medical Guidance For Crisis Relocation Planners

1. Introduction

This section contains guidance to assist civil preparedness personnel in planning for the use of allied professional medical (non-hospital) facilities in support of the Health and Medical (H/M) Service during crisis relocation. Allied professional medical facilities that are considered in this section include nursing home, veterinary, osteopathic (osteopaths offices), chiropractic, and dental facilities.

The guidance presented in this section was written as an appendix to "Health and Medical Guidance for Crisis Relocation Planners"\* , and does not duplicate the planning considerations contained therein. For the most part, the planning considerations in "Health and Medical Guidance for Crisis Relocation Planners" need not be modified to incorporate allied medical facilities. The exceptions are the sections that discuss h/m resources (specifically, sources of planning data), and functions. Planning data sources and functions are expanded upon in this section. Particular emphasis is placed on the development of a list of functions that the planner should consider in developing plans to utilize allied medical facilities. Functions are presented in a tabular format (see Table IV-16).

2. Planning Data Sources

Several sources of general health planning data which were identified in "Health and Medical Guidance for Crisis Relocation Planners" and which may also be helpful in identifying allied medical facilities include:

- . Health Systems Agencies,
- . Local health departments,

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\*Laney, M. N., P. F. Giles, D. R. Johnston, and E. L. Hill, Management of Medical Problems Resulting from Population Relocation, Vol. II. Research Triangle Park, North Carolina: Research Triangle Institute, May 1976.

- . State Health Planning and Development Agencies,
- . Facilities licensure programs administered by state health agencies, and
- . Telephone directories.

Examples of allied medical facilities that may be identified using this approach include nursing homes and, in some states, veterinary hospitals and clinics.

When information on facilities is not available, information may be obtained indirectly from organizations or agencies that are concerned with practitioners instead of the facilities. The following two groups can provide information on practitioners which may be helpful: state licensure agencies, and local and state professional societies. This approach would be helpful, for example, in identifying and locating dental, osteopathic, and chiropractic facilities. Although most states do not regulate these facilities, licensure of the practitioner is required in all states. By identifying the practitioners in a particular area, the numbers and locations of facilities may be estimated (realizing, of course, that a one-to-one ratio may not exist between practitioners and facilities).

### 3. Functions

Crisis relocations functions for allied medical facilities are listed in Table IV-16. The list of functions is intended to serve as a planning aid for crisis relocation planners who are developing plans to utilize allied medical facilities; it is not a comprehensive list of planning guidelines.



Table IV-16. Crisis Relocation Functions for Allied Medical Facilities

Functions	Facilities							
	Nursing Homes		Veterinary Facilities		Osteopathic Facilities		Chiropractic Facilities	
	Evacuating	Host State	Evacuating	Host State	Evacuating	Host State	Evacuating	Host State
Internal Readiness Phase								
1. Develop guidelines for classifying patients in terms of their ability to be discharged and/or evacuated.	X	X						
2. Develop plans to discharge able patients.	X	X						
3. Develop plans to consolidate staff members and/or patients into a selected facility(s).	X	X						
4. Plan to consolidate patients within each facility.		X						
5. Plan to utilize suitable means of transportation (e.g., ambulances) to move patients who cannot be discharged.	X							
6. Plan to provide minimal staffing of consolidated facilities during the evacuation phase.	X							
7. Develop plans to discontinue normal and/or non-essential practices.								
8. Plan to expand primary care capabilities by adding h/w personnel.			X	X	X	X	X	X
9. Estimate the type and amount of drugs, biologicals, and medical supplies that will be required during the evacuation phase.	X	X			X	X	X	X
10. Establish plans to obtain needed medical supplies.	X	X			X	X	X	X
11. Determine the amount of medical supplies and pharmaceuticals that can be allocated to host areas.	X		X		X		X	
12. Prepare a list of pharmaceuticals, diagnostic and therapeutic equipment, etc., adaptable to primary care.								
13. Prepare assignments for staff members.	X							
14. Cooperate in the allocation of personnel to host area facilities.	X							
15. Plan for the use of allocated personnel, medical supplies, and drugs.		X		X		X		X

(Cont. Inmed)

Table IV-16. Crisis Relocation Functions for Allied Medical Facilities (Continued)

Functions	Facilities											
	Nursing Homes		Veterinary Facilities		Osteopathic Facilities		Chiropractic Facilities		Dental Facilities			
	Jurisdictions											
Internal Readiness Phase	Evacuating	Host	State	Evacuating	Host	State	Evacuating	Host	State	Evacuating	Host	State
	X	X		X			X			X		
			X									
16. Maintain all equipment at required levels of performance.												
17. Review plans by host and evacuating jurisdictions to reduce patient census.			X									
18. Review consolidation plans of both host and evacuating jurisdictions.			X									
19. Review plans by host and evacuating areas to suspend normal and/or nonessential services.				X					X			X
20. Review host jurisdiction plans to use allied medical facilities to augment primary care services.			X	X			X		X			X

(Continued)

Table IV-16. Crisis Relocation Functions for Allied Medical Facilities (Continued)

Functions	Facilities									
	Nursing Homes		Veterinary Facilities		Osteopathic Facilities		Chiropractic Facilities		Dental Facilities	
	Evacuating	Host State	Evacuating	Host State	Evacuating	Host State	Evacuating	Host State	Evacuating	Host State
<b>Facilities Jurisdictions</b>										
<b>Mobilization Phase</b>										
1. Review plans to augment primary care services.	X		X		X		X		X	
2. Identify patients who may be discharged and/or evacuated and prepare them for discharge.	X		X		X		X		X	
3. Coordinate the consolidation of remaining patients.	X		X		X		X		X	
4. Review assignments of staff members and alter if indicated.	X		X		X		X		X	
5. Contact staff members and verify their assignments.	X		X		X		X		X	
6. Review plans to suspend normal and/or nonessential practices.			X		X		X		X	
7. Review plans to increase existing primary care capabilities.					X		X		X	
8. Review inventories of drugs, biologicals, and medical supplies.	X		X		X		X		X	
9. Alert Resource and Supply Service of additional drug and supply need.	X		X		X		X		X	
10. Prepare to receive allocated h/w personnel, pharmaceuticals, and supplies from the evacuating jurisdictions.			X		X		X		X	
11. Advise host jurisdictions to make final preparations for upgrading facilities.		X		X		X		X		X
12. Request report from host and evacuating jurisdictions on the progress of mobilizing allied medical facilities. Provide advice as necessary.		X		X		X		X		X

Table IV-16. Crisis Relocation Functions for Allied Medical Facilities (Continued)

Functions	Facilities											
	Nursing Homes			Veterinary Facilities			Osteopathic Facilities			Chiropractic Facilities		
	Evacuating	Host	State	Evacuating	Host	State	Evacuating	Host	State	Evacuating	Host	State
Evacuation Phase												
1. When the relocation order is given, notify h/m personnel to report to their assigned stations and determine if staffing is adequate; notify the administrative section if augmentation is required.	X	X										
2. When the relocation order is given, discharge all able patients to the care of families, friends, or other responsible parties.	X	X										
3. Consolidate remaining patients.	X	X										
4. Provide minimal, 24-hour staffing in consolidated facilities by using two teams.	X											
5. Inform the administrative section of the status of the patient census.	X	X										
6. If requested, allocate h/m personnel and/or supplies to host jurisdictions.	X			X			X			X		
7. Suspend normal and/or nonessential practices.				X			X			X		
8. Help staff facilities with allocated h/m personnel.				X			X			X		
9. Maintain inventories of medical supplies and drugs; notify Resource and Supply Service of needs.	X	X		X			X			X		
10. Monitor activities of allied medical facilities during the evacuation phase.			X			X			X			X
11. Continue to augment primary care services during the evacuation phase; stepdown operations as evacuees return to their homes.		X		X			X			X		
12. Return to normal operations when crisis relocation has ended.	X	X		X			X			X		
13. Inventory all drugs, supplies, and equipment when crisis relocation is over.												
14. Identify problems encountered while using facilities to provide primary care in support of h/m services. Request recommendations for revisions of future plans.			X			X			X			X



F. Fremont County Crisis Relocation Plan, Annex D, Health and Medical Service, Appendix 5, Allied Medical Facilities

1. Introduction

This section presents a prototype plan for the utilization of allied professional medical facilities during crisis relocation. In order to incorporate this prototype into existing crisis relocation plans, it was written as an appendix, Appendix 5, to the "Fremont County Crisis Relocation Plan, Annex D, Health and Medical Service\*." Thus, only information pertinent to allied medical facilities is included in this prototype plan; none of the original Fremont County Crisis Relocation Plan is repeated. It is noted that the original Fremont County H/M Annex considers briefly the role of nursing homes. This prototype plan will expand and update that original discussion.

2. Participating Organizations

The following is a list of allied medical facilities, locations, and phone numbers that should be included in the Coordination section (Section V) of the Fremont County Crisis Relocation Plan.

<u>Facility</u>	<u>Location</u>	<u>Telephone Number</u>
<u>Nursing Homes</u>		
Bethesda Care Center	515 Fairview Ave., Canon City	275-9303
Canon Lodge, Inc.	905 Harding Ave., Canon City	275-4106
Hildebrand Care Center	1401 Phay St., Canon City	275-8656
St. Thomas More Hospital and Progressive Care Center	1019 Sheridan Ave., Canon City	275-3381
Valli-Vu Nursing Home	2120 N. 10 St., Canon City	275-7569
Colorado State Veterans Nursing Home	Moore Drive, Florence	784-6331

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\*Laney, M. N., P. F. Giles, D. R. Johnston, and E. L. Hill, Management of Medical Problems Resulting from Population Relocation, Vol. II. Research Triangle Park, North Carolina: Research Triangle Institute, May 1976.

St. Joseph Manor	Third & Washington Ave., Florence	784-6361
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#### Veterinary Hospitals and Clinics

Four Mile Veterinary Hospital	U. S. 50 & 4-Mile Lane, Canon City	275-6318
Fremont Veterinary Hospital	245 Greydene Ave., Canon City	275-7454
Kenline Veterinary Clinic	1426 S. 9, Canon City	275-2081

#### Chiropractic Facilities

Chiropractic Health Clinic	1310 Main, Canon City	275-4126
M. Christiansen	607 Greenwood Ave., Canon City	275-8109
Country Green Chiropractic Office	3055 E. Hwy. 50, Canon City	275-1611
L. Shonyo	1515 N. 10, Canon City	275-9296

#### Osteopathic Facilities

None

#### Dental Facilities

E. Atha, J. Kern, R. Smith	3055-1/2 E. Hwy. 50, Canon City	275-5933
O. Hoffman	103 S. 9, Canon City	275-4477
R. Jacobshagen	215 N. 5, Canon City	275-7740
T. Moll	1341 Phay Ave., Canon City	275-8950
M. Campbell	123 S. Pikes Peak Ave., Florence	784-3578
C. Gangel	608 Yale Pl., Canon City	275-5969
S. Howe	830 Macon Ave., Canon City	275-3859
R. Icabone	1204 Main, Canon City	275-3859
J. Roberts	100 S. Pikes Peak Ave., Florence	784-3935
L. Robertson	608 Yale Pl., Canon City	275-7227
R. Tuttle	718 Floral Ave., Canon City	275-3905

### 3. Medical Care Facilities

The following is a discussion of the responsibilities of the allied medical facilities in Fremont County that should be included in the Responsibilities section (Section IV) of the Fremont County Crisis Relocation Plan.

#### a. Nursing Homes (See Appendix 5-a)

Collectively, the seven state-licensed nursing homes in Fremont County have about 630 beds (the St. Thomas More complex, with 120 beds, has both a nursing care facility and a rehabilitation center). During crisis relocation, it is believed that the nursing homes in Fremont County could be used to augment St. Thomas More and St. Joseph Hospitals. In this prototype plan, the St. Thomas More nursing facility (nursing care facility and rehabilitation center) is considered separately because of the facility's close proximity to the hospital. This closeness is likely to make the St. Thomas More nursing facility especially useful for augmenting services at St. Thomas More Hospital. The plan for St. Thomas More Nursing Facility and Rehabilitation Center should be applicable to St. Joseph Manor, which is located adjacent to St. Joseph Hospital in Florence. In addition, it is expected that the plan will be generally applicable to the other nursing homes. Differences in patients and services among the individual nursing facilities will affect somewhat the appropriateness of the plan for the other facilities.

#### b. Veterinary Hospitals and Clinics (See Appendix 5-b)

There are three veterinary facilities in Fremont County, all of which are in Canon City. Although veterinary facilities offer many services that are suitable for human health care, the facilities are not equipped to provide human inpatient services. However, it is believed that these

facilities may be very useful as outpatient clinics, especially when they are located proximately to a hospital. Since none of the veterinary facilities in Canon City are located near St. Thomas More Hospital, (the closest facility is on Greydene Avenue), and since there are no veterinary hospitals or clinics in Florence that could serve as an outpatient clinic in conjunction with St. Joseph Hospital, the three veterinary facilities are considered collectively in the prototype plan.

c. Chiropractic Facilities (See Appendix 5-c)

Fremont County has four chiropractors, each with their own practice (Dr. Shonyo's practice is rather limited, seeing patients only at his home); all are in Canon City. In addition to their usual practice, chiropractic offices could serve as outpatient clinics or as diagnostic X-ray departments. Chiropractic offices are considered collectively in the prototype plan, even though differences in individual practices may somewhat affect the appropriateness of the plan.

d. Dental Offices (See Appendix 5-d)

There are eleven dental offices in Fremont County, nine of which are in Canon City and two of which are in Florence. Most of the offices are located in or near the central business districts of Canon City and Florence. Crisis relocation responsibilities will be similar for these facilities, thus, they too are considered collectively in the prototype plan.

4. Appendixes 5-a through 5-d

This section includes detailed plans for the Fremont County allied medical facilities that should be included in the appendixes to the Fremont County Crisis Relocation Plan.



Appendix 5-a

St. Thomas More Nursing Facility

ORGANIZATION:

Administrator: Sister M. Judith Kuhn

Assistant Administrator: Mr. Paul Masar

REQUIREMENTS:

Beds, dressings, bandages, hypodermic needles, syringes, thermometers, blood pressure cuffs, stethoscopes, catheters, oxygen therapy equipment, physical therapy equipment, laundry, and kitchen

RESPONSIBILITIES:

Preparatory Period

1. Plan to augment the provision of medical care for Fremont County residents and evacuees during the relocation period.
2. Develop a patient classification scheme so that able patients can be discharged.
3. Plan to relocate remaining patients to other nursing homes, as feasible, or consolidate the remaining patients within the center.
4. Assess the possibility of utilizing non-medical facilities (e.g., hotels and motels) to house discharged patients during crisis relocation; plan to provide custodial care for such discharged patients.
5. Assess the possibility of placing able patients in homes of Fremont County residents during the relocation period.
6. Determine the types of hospital-support services that the nursing facility can best provide during crisis relocation.
7. Estimate the types and amounts of drugs and medical supplies required to provide care for the patient load anticipated during crisis relocation.
8. Establish procedures to obtain additional medical supplies from the state jurisdiction or other jurisdictions.

9. Develop plans to utilize allocated h/m resources from the Colorado Springs risk area.
10. Prepare and maintain a list of nursing home employees, their addresses, and telephone numbers.
11. Maintain all equipment at required levels of performance.

#### Relocation Period

1. Provide support to the hospital in providing h/m care during the crisis relocation period.
2. Notify employees that crisis relocation has begun and advise them to report to their assigned duty stations.
3. Discharge all able nursing home patients to the care of families, friends, or other responsible parties.
4. Consolidate remaining patients.
5. Notify the hospital administrator and/or the Deputy Coordinator of Medical Care of personnel and supply shortages.
6. When crisis relocation is over, return to normal operations as conditions allow.
7. Identify problems encountered during the relocation period so that they may be addressed and planned for when the Fremont County Crisis Relocation Plan is revised.

#### DEPLOYMENT:

St. Thomas More Progressive Care Center employees will be stationed primarily in the nursing facility with overlapping duties in the hospital as conditions require.

Appendix 5-b

Fremont County Veterinary Facilities

ORGANIZATION:

Four Mile Veterinary Hospital

Fremont Veterinary Hospital

Kenline Veterinary Clinic

REQUIREMENTS:

Examination room and equipment, pathology and X-ray equipment,  
pharmaceuticals, surgical equipment, anesthetics, mobile veterinary unit

RESPONSIBILITIES:

Preparatory Period

1. Plan to provide medical support on an outpatient basis.
2. Plan to suspend non-essential animal care practice.
3. Identify pharmaceuticals, diagnostic equipment, etc., that could be adapted to human health care.
4. Submit to Deputy Coordinator of Medical Care a list of services that each facility could be expected to provide in order to help coordinate h/m services during crisis relocation.
5. Establish a procedure to obtain additional medical supplies.
6. Plan to have veterinarians share facility with physician(s) and/or nurse clinicians in the event of crisis relocation.
7. Plan to utilize mobile units to provide outpatient care to outlying areas, e.g., Coal Creek and Rockvale.
8. Maintain all equipment at required levels of performance.

#### Relocation Period

1. Provide medical support to the Fremont County h/m service organization during the crisis relocation period.
2. Forego non-essential medical care of animals during the relocation period.
3. Provide outpatient services; refer to St. Thomas More Hospital those patients in need of inpatient care or other higher levels of care.
4. Veterinarians should assist physicians as the situation dictates. During non-emergency periods when the greatest needs are essentially primary care, it is considered desirable to have physicians and/or nurses providing medical care for humans. In the event of a disaster and resulting mass casualties, this situation may be altered.
5. Notify Deputy Coordinator of Medical Care of medical supply needs.
6. When crisis relocation is over, return to normal operations as conditions allow.
7. Identify problems encountered during the relocation period and revise the Fremont County Crisis Relocation Plan accordingly.

#### DEPLOYMENT:

Veterinarians will report to their clinic or hospital.



Appendix 5-c

Fremont County Chiropractic Facilities

ORGANIZATION:

Chiropractic Health Clinic

M. Christiansen

Country Green Chiropractic Office

L. Shonyo

REQUIREMENTS:

Examination room and equipment, X-ray machine

RESPONSIBILITY:

Preparatory Period

1. Plan to provide support to Fremont County H/M Service.
2. Plan to share the office with another chiropractor or with a physician or nurse practitioner in order to increase patient care capabilities. This may be done by making the facility available for additional services during the chiropractor's non-working hours. Or, if the facility is large enough, it may be divided up to allow another practitioner to see patients.
3. Plan to reduce patient load during crisis relocation by cancelling all but the essential patient appointments in order to increase the availability of examination facilities and X-ray machines.
4. Establish procedures, in consultation with Deputy Coordinator of Medical Care, to obtain medical supplies and equipment as needed.
5. Maintain equipment at required level of performance.

Relocation Period

1. Provide support in the form of outpatient services to the Fremont County H/M Service.

2. Make office available to another chiropractor, physician, or nurse practitioner to expand outpatient services.
3. Request medical supplies and equipment necessary to provide simple outpatient services from Deputy Coordinator of Medical Care. Request additional supplies as needed.
4. Cancel unnecessary patient appointments as appropriate to increase the availability of facility.
5. When crisis relocation is over, return to normal activities as conditions permit.
6. Identify problems encountered during the relocation period and suggest improvements to the Fremont County Crisis Relocation Plan, H/M Service Annex.

DEPLOYMENT:

Chiropractors will be stationed at their place of practice.

Appendix 5-d

Fremont County Dental Offices

ORGANIZATION:

E. Atha, J. Kern, R. Smith  
O. Hoffman  
R. Jacobshagen  
T. Moll  
M. Campbell  
C. Gangel  
S. Howe  
R. Icabone  
J. Roberts  
L. Robertson  
R. Tuttle

REQUIREMENTS:

X-ray equipment, sterilization equipment, dental equipment

RESPONSIBILITIES:

Preparatory Period

1. Plan to meet the increased needs for dental services during crisis relocation.
2. Develop plans to forego or delay elective dental procedures in order to treat patients with conditions that are immediately threatening to their health.
3. Estimate ability to increase patient load and determine amount of additional supplies that may be needed.
4. Establish procedure in cooperation with Deputy Coordinator of Medical Care to obtain additional supplies during relocation.

5. Determine ability to expand services by adding another dentist(s) to the practice. If this appears feasible, inform Deputy Coordinator of Medical Care that space exists for additional dentist (several dentists relocating from the Colorado Springs risk area may be allocated to Fremont County).
6. Assess ability to provide medical care on an outpatient basis by sharing the facility with a physician or nurse practitioner.
7. Maintain equipment at required level of performance.

#### Relocation Period

1. Expand dental services, as feasible, to accomodate the increased Fremont County population during crisis relocation.
2. Delay elective procedures and accept only patients with conditions in need of immediate attention.
3. Request additional supplies, as appropriate.
4. Add additional dentist(s) as feasible, from risk area in order to handle expected increases in patient loads.
5. Provide medical outpatient care, if necessary. Dentist(s) assist physicians as the situation dictates.
6. Return to normal operations as conditions allow when crisis relocation has ended.
7. Identify problems encountered during the relocation period and revise the Fremont County Crisis Relocation Plan, H/M Service Annex accordingly.

#### DEPLOYMENT:

Dentists will be located in their own offices.



## V. CAPABILITY OF THE CENTER FOR DISEASE CONTROL AND STATE COUNTERPART LABORATORIES TO FUNCTION IN DISASTER AND CRISIS ENVIRONMENTS

### A. Introduction

This section describes the results of research to determine the capability of public health laboratories to provide diagnostic microbiology support for communicable disease control efforts following a natural disaster or a nuclear attack as well as during crisis relocation. This section identifies the communicable diseases of potential significance and specifies the microbiology procedures employed in diagnosing such diseases. The technical capabilities of the several state public health laboratories are then assessed by determining their ability to perform the requisite procedures. Diagnostic microbiology laboratory locations and their relation to nuclear attack risk areas are examined as are plans for controlling communicable diseases during emergencies. The chapter concludes with recommendations for public health laboratories on ways to upgrade their current plans and programs in order to support communicable disease control efforts during emergencies.

#### 1. Background

Several studies of postattack health problems have emphasized the importance of communicable diseases as a cause of morbidity and mortality among attack survivors. One such study, a computer simulation, estimated that a fully effective medical support system would save the lives of 7 percent of the direct effects casualties and 3 to 4 percent of the noncommunicable and chronic disease cases, while communicable disease treatment and control would save the lives of approximately 15 percent of the surviving population [Ref. 1].

Thus, postattack control of communicable diseases appears to offer considerable benefits in terms of lives saved.

Diagnostic microbiology is an essential part of communicable disease control. Mitchell [Ref. 2], in his study of the control of communicable diseases in the postattack environment, ranked diagnostic laboratory capability third in a list of nine priority functions.

Apparently, the concern for maintaining a diagnostic microbiology capability antedates the studies cited above. In the early 1960's a resolution of the Association of State and Territorial Health Officers suggested the concept of a national epidemiological laboratory network which would provide services in a nuclear attack emergency. In response to that resolution, Dr. U. Pentti Kokko, then Director of the Bureau of Laboratories at the Center for Disease Control (CDC) sent a one-page questionnaire to each of the state health departments in 1962. Nothing further was done until 1965 when, at the request of the Division of Health Mobilization, Public Health Service, CDC undertook a survey of selected laboratories as a first step in developing a laboratory network. In that survey, which was performed during the 1965-67 period, on-site visits were made to 382 laboratories. These laboratories were selected on the basis of the following criteria: microbiology capability, distance from large population centers, nonassociation with an immediate patient care facility, and capability for expansion during an emergency period. Among the 382 laboratories, 319, 19, 36, and 8 were under official health agency, academic, hospital, or "other" proprietorship, respectively. Data on diagnostic procedures performed, supplies and reagents, personnel (education and experience), equipment, facilities and safety equipment, and glassware preparation were collected. To date, only preliminary tabulations of the data have been prepared, and

no further progress has been made in the development of a laboratory network [Refs. 3 and 4].

In the minds of many people, including many health professionals, natural disasters are followed by epidemics of dreaded communicable diseases. For example, in spite of advice to the contrary and a lack of supporting data, it is widely believed that outbreaks of typhoid fever are a major threat following floods in the United States. The ad hoc typhoid fever immunization campaigns initiated in flood-stricken areas attest to this belief. While the threat of serious communicable diseases following natural disasters is minimal today, there is still the potential for certain less serious communicable diseases in post-disaster environments if social disruption, crowding, and poor sanitary conditions prevail [Ref. 5].

A study of health problems resulting from population relocation concluded that, in the United States, the communicable diseases of potential importance during crisis relocation are the same diseases that are of potential significance during natural disasters [Ref. 6].

In view of the potential importance of communicable diseases following nuclear attack and natural disasters and during crisis relocation, it appears most appropriate to inquire about the capability of public health laboratories to function in such emergencies.

In the United States, diagnostic microbiology in support of communicable disease control is performed primarily by governmental laboratories. At the federal level, the Public Health Services' CDC, with headquarters in Atlanta, provides diagnostic microbiology services. All 50 states operate public health laboratories, usually within a Department of Health or Human Resources, whose historic role has been diagnostic microbiology for communicable disease

control. In addition, a number of city and county health agencies do some diagnostic microbiology.

## 2. Research Objectives

The overall objective of this research was to ascertain the capability of CDC and state counterpart laboratories to function in disaster and crisis environments, including nuclear and natural disasters. Specific objectives of this research were to:

- Investigate current plans and procedures for controlling the spread of communicable diseases,
- Ascertain the extent of preplanning within plans and procedures designed to handle mass exposure problems,
- Make recommendations for upgrading current programs to assure their capability of controlling communicable diseases, and
- Consider the probable impact of radioactive fallout on (1) the susceptibility of people to communicable diseases and (2) the operational capability of public health laboratories to perform laboratory procedures in support of communicable disease control.

## B. Communicable Diseases

In order to evaluate the capability of public health laboratories to perform laboratory procedures in support of communicable disease control, it is first necessary to identify the communicable diseases of potential postattack and/or natural disaster significance. The diseases currently endemic to the United States, as well as those identified specifically in analyses of postattack, crisis relocation, and natural disaster situations, are discussed in this section.



1. Currently Endemic Diseases

To some extent, any disease that is endemic\* to the United States is potentially significant as a postattack problem, a crisis relocation problem, or as a consequence of a natural disaster. Hence, it is appropriate to identify the more important communicable diseases that are currently endemic to the United States. This is done in Table V-1 in which the number of cases and incidence are included for each listed notifiable disease.

2. Diseases of Potential Postattack Significance

Analyses of postattack communicable disease problems performed for the Office of Civil Defense (OCD) identified vectorborne, enteric, and respiratory diseases of potential postattack significance [Refs. 7-9]. Those communicable diseases are listed in Table V-2.

The diseases identified as potentially significant postattack in Table V-2 were obtained from studies performed for OCD in the late 1960's, and there is little doubt that if the same studies were performed today the resulting list of communicable diseases would be different. However, for the purpose of this analysis, the specific diseases are less important, perhaps, than the laboratory capabilities required for their diagnosis. Thus, the ability to perform diagnostic tests for the diseases listed in Table V-2 involves the following capabilities: anaerobic bacteriology; enteric bacteriology; parasitology; bacterial, viral, and rickettsial serology; virus isolation; etc. Laboratories capable of performing tests for all, or even most, of the diseases listed in Table V-2 would be technically capable of dealing with a wide range of communicable disease problems involving a variety of infectious agents.

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\*The constant presence of a disease or infectious agent within a given geographic area.

Table V-1. Reported Communicable Disease Cases and Incidence,  
United States, 1976

Disease	Number of Cases	Cases per 100,000 Population
Amebiasis	2,906	1.35
Anthrax	2	0.00
Aseptic meningitis	3,510	1.64
Botulism	37	0.02
Brucellosis	296	0.14
Chickenpox	183,990	96.06
Diphtheria	128	0.06
Encephalitis, primary	1,518	0.78
Encephalitis, post-infectious	266	0.14
Hepatitis A	33,288	15.51
Hepatitis B	14,973	7.14
Hepatitis, unspecified	7,488	3.57
Leprosy	145	0.07
Leptospirosis	73	0.03
Malaria	471	0.22
Measles (rubeola)	41,126	19.16
Meningococcal infections, total	1,605	0.75
Mumps	38,492	17.93
Pertussis (whooping cough)	1,010	0.47
Polio myelitis, total	14	0.01
Paralytic	12	0.01
Psittacosis	78	0.04

Continued

Table V-1. Reported Communicable Disease Cases and Incidence,  
United States, 1976 (Continued)

Disease	Number of Cases	Cases per 100,000 Population
Rabies in man	2	0.00
Rheumatic fever, acute	1,865	1.32
Rubella (German measles)	12,491	5.82
Rubella congenital syndrome	30	0.01
Salmonellosis, excluding typhoid fever	22,937	10.74
Shigellosis	13,140	6.15
Tetanus	75	0.03
Trichinosis	115	0.05
Tuberculosis	32,105	14.96
Tularemia	157	0.07
Typhoid fever	419	0.20
Typhus fever, flea-borne (endemic, murine)	69	0.03
Typhus fever, tick-borne (Rocky Mountain spotted)	937	0.44
Venereal diseases (newly reported civilian cases):		
Syphilis, primary and secondary	23,731	11.14
Syphilis, total all stages	71,761	33.69
Gonorrhea	1,001,994	470.47

Continued

Table V-1. Reported Communicable Disease Cases and Incidence,  
United States, 1976 (Continued)

Disease	Number of Cases	Cases per 100,000 Population
Other specified venereal diseases:  chancroid, granuloma inguinale, and lympho- granuloma venereum	1,064	0.49

Source: Morbidity and Mortality Weekly Report, Annual Summary 1976, Vol. 25,  
No. 53 (August 1977).



Table V-2. Communicable Diseases of Potential Postattack  
and/or Natural Disaster Significance

	Postattack	Natural Disaster
Amebiasis . . . . .	X . . . . .	
Diphtheria . . . . .	X . . . . .	
Encephalitis, arthropod-borne, viral . . . . .	X . . . . .	
Food Poisoning . . . . .		X
Botulism . . . . .	X . . . . .	
<u>Cl. perfringens</u> food poisoning . . . . .	X . . . . .	
Salmonellosis . . . . .	X . . . . .	
Staphylococcal food poisoning . . . . .	X . . . . .	
Gastroenteritis, viral . . . . .	X . . . . .	
Hepatitis A . . . . .	X . . . . .	X
Influenza . . . . .	X . . . . .	X
Measles . . . . .	X . . . . .	
Meningococcal meningitis . . . . .	X . . . . .	
Non-specific diarrhea . . . . .		X
Paratyphoid B . . . . .	X . . . . .	
Plague . . . . .	X . . . . .	
Pneumonia . . . . .	X . . . . .	
Rabies . . . . .	X . . . . .	
Scarlet fever . . . . .	X . . . . .	
Shigellosis . . . . .	X . . . . .	X
Smallpox . . . . .	X . . . . .	
Typhoid fever . . . . .	X . . . . .	
Typhus fever, louse-borne . . . . .	X . . . . .	

Continued

Table V-2. Communicable Diseases of Potential Postattack  
and/or Natural Disaster Significance (Continued)

	Postattack	Natural Disaster
Typhus fever, flea-borne . . . . .	X . . . . .	
Whooping cough . . . . .	X . . . . .	

Source: Johnson, T., and D. R. Johnston, Vectorborne Disease and Control, R-OU-303, OCD Work Unit 3412C. Research Triangle Park, N.C.: Research Triangle Institute, September 1967.

Johnston, D. R., M. E. Fogel, A. W. Voors, and E. L. Hill, Post-Attack Prevention and Control of Enteric Diseases, R-OU-406, OCD Work Unit 3412D. Research Triangle Park, N.C.: Research Triangle Institute, September 1969.

Voors, A. W., and B. S. H. Harris, Postattack Communicable Respiratory Diseases, R-OU-493, OCD Work Unit 3412E. Research Triangle Park, N.C.: Research Triangle Institute, November 1970.

Western, K. W., The Epidemiology of Natural and Man-Made Disasters: The Present State of the Art, unpublished dissertation submitted for the Academic Diploma in Tropical Public Health of the London School of Hygiene and Tropical Medicine, June 1972.

Exposure to ionizing radiation increases the host's susceptibility to contract communicable diseases. This fact is well documented in studies by Taliaferro [Ref. 10] and Stoner [Ref. 11]. Voors [Ref. 12] reviewed their work, as well as that of other authors, and concluded that the following changes in the host due to radiation exposure lead to increased susceptibility:

- . Decreased antibody response,
- . Increased hypersensitivity to antibiotics,
- . Increased susceptibility to toxins,
- . Decreased effectiveness of cellular defense mechanics, and
- . Decreased effectiveness of, and sometimes increased harm from, immunizing agents.

### 3. Diseases of Potential Significance Following Natural Disasters

The diseases of potential significance following a natural disaster also are shown in Table V-2. The listed diseases are those suggested by Western [Ref. 5] as ". . . the endemic diseases most likely to be affected following disasters in developed areas . . ." At the same time he also notes, "In actuality, no studies have been done to document the effect disasters have on these conditions. The clinical experience is that these diseases rarely cause post-disaster medical problems at higher than expected numbers." The listed diseases are potential problems if social disruption, crowding, and deficient sanitation accompany a natural disaster.

Western also states that he could not locate a single medical report of a documented outbreak of a serious communicable disease following a disaster in either Europe or North America since 1945 [Ref. 13]. He attributes this finding to a general rise in sanitary conditions, plus the following factors:

- . The disappearance of formerly important diseases from the population,

- . A high level of vaccine-induced immunity,
- . The use of antimicrobials, and
- . The great reduction in disease prevalence.

#### 4. Diseases of Potential Significance During Crisis Relocation

In an earlier study [Ref. 6], it was concluded that the diseases listed for natural disasters are also potentially significant during crisis relocation.

In view of the fact that the communicable diseases listed in Table V-2 were identified in analyses specifically concerned with postattack and natural disaster environments, they will be used as the basis for the subsequent analysis of public health laboratory capabilities. It is interesting to note that, with the exceptions of smallpox and louseborne typhus fever, some cases of each of the diseases listed in Table V-2 occurred in the U.S. during 1976.

#### C. Technical Capability of State Public Health Laboratories

This section identifies and describes the diagnostic laboratory procedures required for identifying the communicable diseases of interest and presents an assessment of the current technical capability of state public health laboratories to perform the requisite procedures.\* Their capability (and that of the CDC to perform the required procedures in a natural disaster, during crisis relocation, and following a nuclear attack is discussed in Section F.

##### 1. Required Laboratory Procedures

Using the list of communicable diseases presented in Table V-2 as a starting point, laboratory diagnostic procedures for each of the diseases were excerpted from Control of Communicable Diseases in Man and Report of the Committee on Infectious Diseases. The results of that exercise are shown in Table V-3.

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\*The technical capability of the CDC is not in question here.



Table V-3. Laboratory Diagnostic Procedures for Communicable Diseases of Potential Postattack or Natural Disaster Significance

Disease	Laboratory Diagnostic Procedure
Amebiasis	Microscopic demonstration of trophozoites or cysts in fresh fecal specimens, smears obtained by proctoscopy, aspirates of abscesses, or tissue sections. Serological tests are useful in diagnosing all forms of amebiasis, with the exception of the asymptomatic cyst passer.
Diphtheria	Swab both nose and throat. Streak on fresh Pai's, Loeffler's, blood agar, tellurite, or Tinsdale's media and examine after 8 to 24 hours incubation. Fluorescent antibody technique is reliable only if performed by experienced personnel.
Encephalitis, arthropod-borne, viral	Demonstration of antibody titer rises between early and late specimens of serum by neutralization, complement fixation, and hemagglutination inhibition.
Food Poisoning	
Botulism	Demonstration of the specific toxin in blood serum or stool or its presence in a suspected food item.
<u>Clostridium perfringens</u> food poisoning	Semiquantitative bacteriological examination of food and patient's stools; anaerobic techniques usually demonstrate same serotype in both food and stools.
Salmonellosis	Recovery on usual enteric media from feces and from the blood during the acute stages of illness.
Staphylococcal food poisoning	Recovery of enterotoxin-producing staphylococci on routine culture media from stomach contents, feces, or suspected food item; phage typing, and enterotoxin tests.

Continued

Table V-3. Laboratory Diagnostic Procedures for Communicable Diseases  
of Potential Postattack or Natural Disaster Significance  
(Continued)

Disease	Laboratory Diagnostic Procedure
Gastroenteritis, viral	Identification of virus in preparations made from stools of ill persons by immune electron microscopy. Serologic evidence of infection can be demonstrated by immune electron microscopy using a particle-positive stool filtrate as antigen.
Hepatitis A	Antigen has been demonstrated by electron microscopic techniques; serological tests are not available for general use at this time.
Influenza	Identification of type (A, B, or C) by complement fixation with group-specific antisera. Characterization of the haemagglutinin (H) and neuraminidase (N) components.
Measles	Isolation of virus from blood, conjunctivae and nasopharynx in tissue culture or demonstration of a rise in specific hemagglutination-inhibiting, hemolysis-inhibiting, or complement-fixing antibodies.
Meningococcal meningitis	Recovery of meningococci from blood and/or spinal fluid; microscopic examination of stained smears from petechiae; identification of group specific meningococcal polysaccharides in spinal fluid by counter-immunoelectrophoresis.
Non-specific diarrhea	Diagnostic tests to exclude known enteric pathogens.
Paratyphoid B fever	Confirmation and individual type identification by bacteriological examination of blood, feces, and urine.
Pneumonia	
Pneumococcal	Demonstration of many gram-positive diplococci in smears of lower respiratory tract secretions constitutes a presumptive diag-

Continued

Table V-3. Laboratory Diagnostic Procedures for Communicable Diseases  
of Potential Postattack or Natural Disaster Significance  
(Continued)

Disease	Laboratory Diagnostic Procedure
	nosis. Confirmation is by isolation of pneumococci from blood or lower respiratory tract specimens.
Mycoplasmal (PPL0)	Demonstration of rise in complement-fixing antibody titers between acute phase and 3-week sera; demonstration of cold hemagglutinins during early convalescence or of agglutinins for Streptococcus MG, or both; culture on special agar.
Plague	Demonstration of causal agent in fluid from buboes, in blood, in spinal fluid, or in sputum.
Rabies	Diagnosis is confirmed by specific fluorescent antibody staining of corneal impressions, mucosal scrapings, frozen skin sections, or brain biopsy for presence of intracytoplasmic virus, and viral isolation by intracerebral mouse inoculation.
Scarlet fever	Provisional laboratory diagnosis of Group A streptococci (Beta hemolytic) based on colonial morphology, beta hemolysis on blood agar, and inhibition by antibiotic discs containing 0.1 units of bacitracin; definitive diagnosis requires specific grouping procedures. Immunofluorescent techniques are available for rapid identification. Rise in serum antibody titer (antistreptolysin O, antihyaluronidase, anti-DNA-ase B) between acute and convalescent stages of illness can be demonstrated.
Shigellosis	Isolation of <u>Shigella</u> from feces or rectal swabs. Pus cells in stool exudate highly suggestive of shigellosis.
Smallpox	Isolation of the virus on chorioallantoic membrane or tissue culture from scrapings of lesions, from vesicular or pustular fluid, from crusts, and often from the

Continued

Table V-3. Laboratory Diagnostic Procedures for Communicable Diseases  
of Potential Postattack or Natural Disaster Significance  
(Continued)

Disease	Laboratory Diagnostic Procedure
	blood during the febrile pre-eruptive period. Rapid provisional diagnosis by electron microscopy or the precipitation-in-gel technique.
Typhoid fever	Demonstration of bacilli in bone marrow and blood early in the disease and in feces and urine after the first week. Agglutination reaction becomes positive during second week.
Typhus fever, epidemic	Complement-fixation reaction with group-specific typhus antigen becomes positive, usually in the second week. Weil-Felix reaction with <i>Proteus</i> OX-19 also becomes positive, but is less helpful because it may be positive in other diseases.
Typhus fever, endemic	As above, plus "Differentiation" from louse-borne typhus is by serologic tests, using washed type-specific rickettsial antigens.
Whooping cough	Recovery of infectious agent from nasopharyngeal swabs obtained during the catarrhal and early paroxysmal stages. Strikingly high white blood counts with a strong preponderance of lymphocytes are found as the whooping stage develops.

Source: Benenson, Abram S., (Ed.), Control of Communicable Diseases in Man, Twelfth Edition. Washington, D.C.: American Public Health Association, 1975.

Report of the Committee on Infectious Diseases, Seventeenth Edition. Evanston, Illinois: American Academy of Pediatrics, 1974.



## 2. Technical Capability of State Public Health Laboratories

Assessing the technical capability of the laboratories involved a two-step process. The first step was to review the 1976 Consolidated Annual Report of the Association of State and Territorial Public Health Laboratory Directors. This document contains information on the diagnostic laboratory tests that are routinely performed by state public health laboratories. For some of the diseases, e.g., rabies, the data on test performed were quite direct. For other diseases, the data presented in the Consolidated Annual Report were not test specific and the capability to perform the tests could only be inferred from the reported performance of similar laboratory tests. The first step was completed with the preparation of a tentative assessment of state laboratory capabilities for each of the diseases of interest.

In the second step, the tentative assessment was submitted to CDC personnel who are well acquainted with state laboratory programs for evaluation.

The review by CDC personnel led to revisions of the capability assessment for several diseases. The final assessment of technical capability is as follows:

- Amebiasis - All state public health laboratories routinely examine specimens for the presence of Entamoeba histolytica. However, only Alabama, Maryland, and South Carolina routinely perform serological tests for amebiasis. Thus, all state public health laboratories are capable of performing diagnostic tests for amebiasis.
- Diphtheria - All state public health laboratories are capable of performing diagnostic tests for diphtheria.
- Encephalitis, arthropod-borne, viral - Viral serology is performed routinely by all state public health laboratories except New

Hampshire. Hence, all but one of the public health laboratories are capable of performing diagnostic tests for encephalitis.

- Food poisoning

Botulism - All state public health laboratories are capable of performing diagnostic tests for botulism.

Clostridium perfringens food poisoning - All state public health laboratories are capable of performing diagnostic tests for Clostridium perfringens food poisoning.

Salmonellosis - All state public health laboratories are capable of performing diagnostic tests for salmonellosis.

Staphylococcal food poisoning - All state public health laboratories are capable of performing diagnostic tests for staphylococcal food poisoning.

- Gastroenteritis, viral - Only the state public health laboratories of California and New York are capable of performing diagnostic tests for viral gastroenteritis.

- Hepatitis A - Only the state public health laboratories of California and New York are capable of performing diagnostic tests for hepatitis A.

- Influenza - With the exception of New Hampshire, all state public health laboratories are capable of performing diagnostic serological tests for influenza.

- Measles - Thirty-nine of the state public health laboratories routinely perform virus isolation (the preferred procedure) on respiratory specimens; New Hampshire, Rhode Island, North Dakota, South Dakota, Nebraska, Delaware, Mississippi, Arkansas, Wyoming, Colorado, and Nevada do not. However, all state public health

laboratories, except New Hampshire, have the capability of performing serological tests for measles. Thus, 49 of the 50 state public health laboratories have the capability of performing diagnostic tests for measles.

- Meningococcal meningitis - All state public health laboratories are capable of performing diagnostic tests for meningococcal meningitis.
- Non-specific diarrhea - All state public health laboratories are capable of performing diagnostic tests on enteric specimens.
- Paratyphoid B fever - All state public health laboratories are capable of performing diagnostic tests for paratyphoid B fever.
- Plague - Only the state public health laboratories of Arizona, California, New Mexico, and Utah are capable of performing diagnostic tests for plague.
- Pneumonia - All state public health laboratories are capable of performing diagnostic tests for pneumococcal pneumonia. The capability of performing diagnostic tests for mycoplasmal (PPL0) pneumonia is unknown.
- Rabies - All state public health laboratories, except for Kansas, Montana, and Nevada, are capable of performing diagnostic tests for rabies.
- Scarlet fever - All state public health laboratories are capable of performing diagnostic tests for the presence of group A, beta hemolytic streptococci.
- Shigellosis - All state public health laboratories are capable of performing diagnostic tests for shigellosis.
- Smallpox - None of the state public health laboratories has the capability of performing diagnostic tests for smallpox.

- Typhoid fever - All state public health laboratories are capable of performing diagnostic tests for typhoid fever.
- Typhus fever, endemic - Rickettsial serology is performed routinely by all state public health laboratories, except New Hampshire.
- Typhus fever, epidemic - Rickettsial serology is performed routinely by all state public health laboratories but New Hampshire.
- Whooping cough - All state public health laboratories have the capability of performing diagnostic tests for whooping cough.
- Water - Bacteriological testing to determine the potability of drinking water will be required postattack and is commonly done following natural disasters such as floods and earthquakes. All state public health laboratories have the capability of performing bacteriological tests for water potability.

In general, the technical capability to perform laboratory diagnostic procedures for communicable diseases of potential postattack and/or natural disaster significance is quite good. For 16 of the 24 diseases of interest, all state public health laboratories have the requisite diagnostic capability. The requisite capability for diagnosing encephalitis, influenza and measles is present in 49 of the 50 laboratories. Forty-seven of the 50 laboratories have the capability of performing diagnostic tests for rabies. As noted in the assessment presented earlier, the technical capability to perform diagnostic tests for viral gastroenteritis, hepatitis A, and plague is limited to a handful of state laboratories, and for smallpox, it does not exist currently at the state level. Fortunately, those states where plague is endemic (Arizona, California, New Mexico, and Utah) do have the capability to perform the laboratory procedures. Smallpox, of course, is not endemic to the United



States; indeed, it appears on the brink of global eradication. However, the lack of capability of performing diagnostic tests for viral gastroenteritis and hepatitis A in particular remains a deficiency.

D. Location in Relation to Nuclear Attack Risk Areas - One objective of this research was to determine if radioactive fallout might be expected to impair the ability of laboratories to perform their functions. In order to examine this relationship, each laboratory location was checked against the risk areas given in High Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes. The results of that procedure are shown in Table V-4 for CDC facilities and in Table V-5 for state public health laboratories.

With respect to Table V-4, it is seen that four of the six facilities are in direct weapons effects areas and two are in what might be termed low-risk areas. Radioactive fallout does not appear to be a problem for these facilities. The Lawrenceville, Georgia facility, designated as the CDC alternate operations site in 1964 [Ref. 14], and the Ft. Collins, Colorado facility appear to be in low-risk areas and might reasonably be expected to be operational in the immediate postattack period.

The locations of the 50 state public health laboratories in relation to nuclear attack risk areas are shown in Table V-5. Again, the main risk appears to be direct weapons effects; 32 of the state laboratories are located in such high-risk areas. Nine of the laboratories are found in high risk areas that are designated as such because both direct weapons effects and radioactive fallout are anticipated in those areas. Only nine out of the 50 state public health laboratories are located in low-risk areas.

In summary, it appears that, in the event of a national attack, the ability of public health laboratories to support efforts to control communicable diseases may be severely impaired. Direct weapons effects rather than radioactive fallout appear to be the main reason for concern.

Table V-4. Location of CDC Facilities in Relation to Nuclear Attack Risk Areas\*

Location	Direct Weapons Effects	Low Risk
State/City		
Alaska, Anchorage	X	
Arizona, Phoenix	X	
Colorado, Ft. Collins		X
Georgia, Atlanta (main facility)	X	
Georgia, Chamblee	X	
Georgia, Lawrenceville (alternate operations site)		X

\*As defined in High-Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D. C.: Defense Civil Preparedness Agency, April 1975.

Table V-5. Location of State Public Health Laboratories  
in Relation to Nuclear Attack Risk Areas\*

Location	High Risk		
State/City	Direct Weapons Effects	Both Direct Weapons Effects and Radioactive Fallout	Low Risk
Alabama, Montgomery	X		
Alaska, Juneau			X
Arizona, Phoenix	X		
Arkansas, Little Rock		X	
California, Berkeley		X	
Colorado, Denver	X		
Connecticut, Hartford		X	
Delaware, Dover		X	
Florida, Jacksonville	X		
Georgia, Atlanta	X		
Hawaii, Honolulu	X		
Idaho, Boise	X		
Illinois, Chicago		X	
Indiana, Indianapolis		X	
Iowa, Iowa City			X
Kansas, Topeka	X		
Kentucky, Frankfort			X
Louisiana, New Orleans	X		
Maine, Augusta			X
Maryland, Baltimore		X	

Continued

Table V-5. Location of State Public Health Laboratories  
in Relation to Nuclear Attack Risk Areas\* (Continued)

Location	High Risk		
State/City	Direct Weapons Effects	Both Direct Weapons Effects and Radioactive Fallout	Low Risk
Massachusetts, Jamaica Plain	X		
Michigan, Lansing	X		
Minnesota, Minneapolis		X	
Mississippi, Jackson	X		
Missouri, Jefferson City			X
Montana, Helena	X		
Nebraska, Lincoln	X		
Nevada, Reno	X		
New Hampshire, Concord			X
New Jersey, Trenton	X		
New Mexico, Albuquerque	X		
New York, Albany	X		
North Carolina, Raleigh	X		
North Dakota, Bismarck			X
Ohio, Columbus	X		
Oklahoma, Oklahoma City	X		
Oregon, Portland	X		

Continued



Table V-5. Location of State Public Health Laboratories  
in Relation to Nuclear Attack Risk Areas\* (Continued)

Location	High Risk		
State/City	Direct Weapons Effects	Both Direct Weapons Effects and Radioactive Fallout	Low Risk
Pennsylvania, Lionville			X
Rhode Island, Providence		X	
South Carolina, Columbia	X		
South Dakota, Pierre			X
Tennessee, Nashville	X		
Texas, Austin	X		
Utah, Salt Lake City	X		
Vermont, Burlington	X		
Virginia, Richmond	X		
Washington, Seattle	X		
West Virginia, South Charleston	X		
Wisconsin, Madison	X		
Wyoming, Cheyenne	X		

\*As defined in High Risk Areas for Civil Preparedness Nuclear Defense Planning Purposes, TR-82. Washington, D. C.: Defense Civil Preparedness Agency, April 1975.

## E. Surveillance and Control of Communicable Diseases

Before considering current laboratory plans and procedures for controlling communicable diseases during emergencies, a brief review of surveillance and control methods appears appropriate. Also, although this task focusses on diagnostic microbiology and laboratories, it is noted that communicable disease control involves epidemiological surveillance, and the use of specific countermeasures, as well as laboratory activities. Indeed, as will be seen below, laboratory diagnosis of communicable diseases is regarded as part of surveillance. Surveillance and control methods are discussed in the following paragraphs.

### 1. Surveillance

Surveillance, as it is practiced in the United States, includes the whole system of collecting, evaluating, and disseminating epidemiological information concerning the control of communicable disease [Ref. 15].

Langmuir [Ref. 16] states that the three main characteristics of communicable disease surveillance are (a) systematic collection of pertinent epidemiological data, (b) orderly consolidation and evaluation of these data, and (c) prompt dissemination of the results.

#### a. Sources of Data

The sources of data essential to surveillance are termed "elements of surveillance" by Langmuir and include:

- . Mortality registration,
- . Morbidity reporting,
- . Epidemic reporting,
- . Laboratory investigations,
- . Individual case investigations,
- . Epidemic field investigations,

- . Epidemiological surveys,
- . Animal reservoir and vector distribution studies,
- . Biologics and drug utilization data, and
- . Demographic and environmental data.

b. Consolidation and Evaluation of Data

The epidemiologist performs this activity by interpreting findings and advising health authorities regarding priorities for control and necessary control measures.

c. Dissemination of Information

The third essential characteristic of surveillance is the rapid dissemination of the evaluations of current problems both to those who submitted the data and to those who are in a position to act and need to know. Appropriate surveillance information should also be given to the public. Thus, two kinds of communications should be issued: a professional report designed for limited distribution to health professionals and a more general report designed to inform the public of health problems.

2. Surveillance in the United States

The principal organization in the United States involved in national-level communicable disease surveillance is the CDC at Atlanta, Georgia. In addition, each of the state health agencies is engaged in surveillance activities.

CDC receives a variety of reports of communicable diseases from state and local health agencies. The reports that are relevant to this research are summarized in the following paragraphs. For a more detailed discussion of this subject, the reader is referred to "Manual of Procedures for National Morbidity Reporting and Surveillance of Communicable Diseases" [Ref. 17].

a. Quarantinable Diseases Covered by International Agreement

State and territorial health officers notify CDC upon the detection of a case or death due to cholera, plague, smallpox, or yellow fever.

b. Weekly Telegraphic Reports of Notifiable Diseases

State and territorial health officers or epidemiologists report by telegram no later than 2 p.m. on Tuesday of each week diseases occurring or reported to the state health department by local health departments during the preceding week. The diseases covered by the Weekly Telegraphic Report are listed in Table V-6.

c. Reports of Epidemics and Unusual Occurrences of Communicable Diseases.

A report is made to CDC as soon as an epidemic or an outbreak of an unusual communicable disease is detected.

d. National Surveillance Programs

Diseases of special interest to CDC are maintained under national surveillance in cooperation with the state health departments. Diseases currently under national surveillance include brucellosis, diphtheria, leprosy, leptospirosis, listeriosis, salmonellosis, shigellosis, tetanus, malaria, trichinosis, aseptic meningitis, encephalitis, enteroviruses, hepatitis, influenza, poliomyelitis, rabies in man, rabies in animals, Rocky Mountain spotted fever, animal bites, psittacosis-ornithosis, and outbreaks of measles, mumps, and rubella.

e. Weekly Mortality Report from Cities

As a means of maintaining surveillance over influenza, 122 U. S. cities submit a weekly mortality report which enumerates influenza, pneumonia, and total deaths. This is the only mortality report regularly submitted to CDC.



Table V-6. Diseases Included in the Weekly Telegraphic Report

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Anthrax	Psittacosis-ornithosis
Aseptic meningitis	Rabies in man
Botulism	Rubella (German measles)
Brucellosis	Rubella congenital syndrome
Chickenpox	Tetanus
Diphtheria	Trichinosis
Encephalitis, primary infectious	Tuberculosis, new active
Encephalitis, post-infectious with pre- or co-existing illness specified	Tularemia
Hepatitis, serum	Typhoid fever
Hepatitis, acute infectious including unspecified cases	Typhus, flea-borne, murine
Leprosy	Typhus, tick-borne, Rocky Mountain spotted fever
Leptospirosis	Venereal diseases:
Malaria	Syphilis, primary and secondary
Measles (rubeola)	Gonorrhea
Meningococcal infections, total military; civilian	Rabies in animals
Mumps	
Polioomyelitis, total	
Paralytic	
Nonparalytic	
Unspecified	

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Source: Manual of Procedures for National Morbidity Reporting and Surveillance of Communicable Diseases, Effective January 1972, DHEW Publication No. (HSM) 72-8113. Atlanta, Ga.: U. S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, n.d.

Thus, it is apparent that CDC has under surveillance all of the diseases of potential postattack and/or natural disaster significance (see Table V-2).

f. Dissemination

The data collected by CDC through the surveillance activities listed above are analyzed by its epidemiology staff and disseminated weekly in the publication Morbidity and Mortality Weekly Report and at longer intervals in a variety of other publications.

Two other CDC surveillance activities that should be mentioned are biologics surveillance and the United States Immunization Survey. In the former activity, producers of immunizing agents report monthly on the number of doses sold or distributed, the number of doses returned, the number of finished doses ready for immediate shipment at the end of the month, and the number of doses not ready for immediate shipment. With the exception of immune serum globulin, the reports cover 100 percent of the U. S. production of the immunizing agents for which surveillance is maintained. Biologics surveillance reports are issued periodically by CDC. A CDC official indicated that, in an emergency, they can determine the status of immunizing agent supplies in the United States in one day. The United States Immunization Survey is conducted every September by the Bureau of the Census in cooperation with CDC. The survey provides information on the immunization status of the population with respect to diphtheria, influenza, measles, poliomyelitis, rubella, smallpox, and tetanus-pertussis. The use of such data in identifying potential communicable disease threats is apparent.

3. Control

Previous analyses performed for OCD evaluated control methods (countermeasures) for communicable diseases in the postattack environment [Refs. 7-9]. Not surprisingly, the countermeasures identified for postattack application were the same as those used to maintain communicable diseases at

their current low levels. These countermeasures are also appropriate for communicable disease control following natural disasters and during crisis relocation. The principal countermeasures, categorized by the mode of disease transmission, (enteric, man-to-man, and vectorborne), are shown in Table V-7.

For diseases transmitted man-to-man, and for those that are vectorborne, the available countermeasures are limited. Thus, for diseases transmitted man-to-man, antimicrobial therapy and immunization are the only available countermeasures.\* For vectorborne diseases, antimicrobial therapy (for those who have contracted the disease) and vector control (as a means of breaking the chain of infection) are the only available countermeasures. For enteric diseases, a number of countermeasures are available (see Table V-7). Note that immunization is not a significant countermeasure for enteric diseases. The immunization available for typhoid fever is of questionable effectiveness; immunizations are not available for most of the other diseases in this category. Strictly speaking, public information is not a countermeasure, but it is essential to the effective use of countermeasures for communicable diseases.

Control of communicable diseases in the United States is a joint undertaking of the local, state, and federal governments through their respective public health agencies. Agencies at all levels are capable of implementing the countermeasures for communicable diseases. At the request of a state, CDC provides assistance in the investigation and control of disease outbreaks. An important form of assistance is the assignment of Epidemic Intelligence Service (EIS) officers to states requesting aid. Currently, 33 EIS officers are assigned to state health agencies.

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\*As noted earlier, radiation exposure of nuclear attack survivors may decrease the effectiveness of immunizing agents.

Table V-7. Principal Communicable Disease Countermeasures  
by Mode of Transmission

Countermeasure	Mode of Transmission		
	Enteric	Man-to-Man	Vectorborne
Antimicrobial therapy	+	+	+
Excreta disposal	+	-	-
Food hygiene	+	-	-
Immunization	+	+	-
Potable water	+	-	-
Public information	+	+	+
Vector control**	+	-	+

\*Typhoid fever only.

\*\*Including rodent control.

Source: Johnson, T., and D. R. Johnston, Vectorborne Disease and Control, R-OU-303, OCD Work Unit 3412C. Research Triangle Park, N.C.: Research Triangle Institute, September 1967.

Johnston, D. R., M. E. Fogel, A. W. Voors, and E. L. Hill, Postattack Prevention and Control of Enteric Diseases, R-OU-406, OCD Work Unit 3412D. Research Triangle Park, N.C.: Research Triangle Institute, September 1969.

Voors, A. W., and B. S. H. Harris, Postattack Communicable Respiratory Diseases, R-OU-493, OCD Work Unit 3412E. Research Triangle Park, N.C.: Research Triangle Institute, November 1970.



F. Current Plans and Procedures for Communicable Disease Control During Emergencies

In order to investigate current plans and procedures for controlling the spread of communicable diseases and to ascertain the extent of preplanning within plans and procedures, visits were made to CDC and four state public health laboratories. During these visits, key personnel were interviewed regarding their plans for emergency operations, and copies of plans, when available, were obtained for subsequent review. The discussion that follows outlines the findings of those visits and the subsequent review of the plans.

1. CDC

The Manual Guide-Emergency contains the 1964 emergency plan for implementation in the event of enemy attack; it sets forth the emergency mission, specifies the Lawrenceville facility as a relocation site for CDC, creates an emergency organization with a line of succession and responsibilities, gives an employee reporting procedure, and addresses interagency working relationships [Refs. 14 and 18]. A 1976 update designated an Emergency Coordinator for "preparedness and operations to deal with emergency conditions resulting from enemy attack or the imminent threat thereof" and a Disaster Assistance Coordinator for "assistance to deal with all crises, disasters, emergencies, etc., not resulting from general or limited war involving U. S. forces" [Ref. 19].

The emergency mission of CDC as set forth in the plan is time-phased. Thus, during the period D to D + 14 days, the inshelter period, the mission is that of personnel protection, building protection, and rehabilitation using the CDC Self-Protection Organization [Ref. 20]. From D + 14 to D+30 days, the immediate postshelter period, CDC facilities and personnel will be made fully available to help meet local emergency health service needs. Once

communications are reestablished, CDC will resume essential national programs with emphasis on direct assistance to state health organizations.

As noted earlier, communicable disease surveillance is a major activity of CDC. Given the potential for communicable disease outbreaks, surveillance clearly will be needed in the postattack period. Western has pointed out that our lack of knowledge concerning communicable diseases following natural disasters is largely due to inadequate and often nonexistent surveillance programs and often leads to the use of inappropriate countermeasures. Hence, he argues for improved disease surveillance following disasters and cites the advantages as follows: (a) surveillance provides baseline data - if an epidemic does develop it is more likely to be recognized, (b) surveillance is less expensive - an outbreak can be confined by vaccinating around index cases in contrast to mass immunization, and (c) epidemiological surveillance and control is feasible in disaster - it was accomplished during the recent Nigerian Civil War [Ref. 13].

CDC officials interviewed indicated that following an attack they would continue to do what they do now. Apparently, no detailed planning for postattack surveillance activities has been accomplished. In a 1974 interview [Ref. 21], however, David Sencer, then CDC Director, suggested some steps that might be taken during an emergency period. These steps are: (a) alert all mechanisms that increased surveillance is needed, (b) increase reporting to twice a week, (c) activate alternative communications media, e.g., radio, and (d) alert alumni of the CDC Epidemiology Program to the need (approximately 1,000 people have served as EIS officers).

The plan directs that the resources which survive an attack be relocated to the Lawrenceville facility. As indicated in Section D., Lawrenceville

appears to be in a low-risk area. The existing plan does not provide for relocating equipment and personnel to the Lawrenceville facility during a preattack crisis period. Detailed plans for equipping and operating diagnostic microbiology laboratories at the Lawrenceville site have not been prepared.

Regarding natural disasters, CDC personnel correctly point out that they routinely provide assistance in surveillance and control of communicable diseases following such events, both in the United States and abroad. It is apparent that CDC has the capability to provide both diagnostic microbiology and surveillance services in support of communicable disease control efforts following natural disasters.

Given the current concept of crisis relocation wherein critical risk-area facilities continue to operate during the relocation period, and assuming that an attack does not occur, it is believed that CDC can continue to function during crisis relocation.

In April 1977, the Acting Assistant Secretary of Health delegated the authority for emergency health functions as they relate to chemical and biological warfare to CDC [Ref. 22]. As the lead agency, CDC is responsible for the development and, in the event of an emergency, implementation of a plan for the prevention, detection and identification of biological and chemical warfare agents in the public sector. Preliminary thinking on the subject is outlined in a CDC position paper presented to the Armed Forces Epidemiological Board on July 7, 1977 [Ref. 23].

## 2. Selected Public Health Laboratories

Four state public health laboratories were visited: Colorado State Department of Health, Denver; Georgia Department of Human Resources, Atlanta; New Mexico Health and Social Services Department, Albuquerque; and North Carolina Department of Human Resources, Raleigh. These laboratories were

selected as sites of convenience, i.e., they could be visited in the course of travel for other contract purposes. At each laboratory, the director and other personnel (who were present by invitation of the director) were queried concerning contingency plans for nuclear attack and natural disaster. The findings are summarized below.

Colorado's plans await the signature of the Governor [Ref. 24]; advance copies could not be obtained for review. The Georgia Emergency and Disaster Operations Plan [Ref. 25] specifies disease prevention and control as a service to be provided by the Department of Human Resources both for nuclear attack contingencies and other disasters. The Georgia Department of Human Resources Disaster Plan [Ref. 26] prepared pursuant to the Emergency and Disaster Operations Plan specifies roles for both epidemiology and laboratory services. New Mexico has plans in preparation at this writing [Ref. 27]. North Carolina's Civil Preparedness Emergency Plan for War [Ref. 28] makes no mention of either public health laboratory service or communicable disease control; however, the North Carolina Disaster Relief and Assistance Plan [Ref. 29] does, and in some detail.

In discussing nuclear attack contingencies with the four state laboratory directors, it became evident that little or no detailed planning for laboratory operations had been done. In view of the fact that these laboratories are located in high-risk areas (Table V), there is reason to question their capability to function following an attack. Alternate operational sites have not been selected by any of the four states. All four laboratory directors stated that their laboratories are capable of supporting communicable disease control efforts following natural disasters and there is no reason to question that assessment. These laboratories also should be able to function during crisis relocation, up until such time as an attack occurs.



In summary, the capability and preparedness for dealing with communicable disease problems following natural disasters appears to be adequate at CDC and at the four state laboratories visited. On the other hand, the level of preparedness for nuclear attack contingencies is quite low at CDC as well as the state laboratories visited. Recommendations for upgrading current programs for controlling communicable diseases postattack are made in the following section.

G. Recommendations for Upgrading Current Programs

This section contains recommendations for upgrading current programs in order to assure their capability of controlling communicable diseases in the event of nuclear war. Recommendations for CDC are to:

- . Prepare a plan for the use of the Lawrenceville facility. The plan should specify emergency functions to be performed and the equipment and personnel to be moved to Lawrenceville during crisis relocation.
- . Identify alternate operations sites in low-risk areas for the Anchorage, Chamblee, and Phoenix activities. Prepare plans for the use of the selected alternate sites.
- . Prepare a plan for postattack communicable disease surveillance. Such plan should provide for making assignments of CDC personnel and EIS alumni prior to an attack, i.e., during normal readiness, alerting them during crisis relocation, etc. Since CDC maintains an up-to-date listing of EIS alumni, their addresses and telephone numbers in the EIS Directory [(Ref. 30)], much of the input for this plan is already on hand.
- . Establish a program to conduct research and train public health workers and disaster planners in the epidemiology of natural and man-made disasters. (It is noted that such a proposal was made by Western [Ref. 13] in 1972.)

Assuming that the situation at the four laboratories visited is representative of state public health laboratories in general, the following recommendations are made:

- . The 41 state laboratories located in high-risk areas should select alternate operations sites in low-risk areas and prepare plans for staffing and equipping them during crisis relocation. In this connection, those states with branch laboratories located in low-risk areas should consider their use as alternate operations sites, assuming the capabilities for diagnostic microbiology and for the expansion of personnel and facilities are adequate for the emergency mission. All laboratories in the state should be considered for possible inclusion in a contingency plan.
- . All state laboratories should review their states' crisis relocation plan to determine if the relocated population necessitates changes in laboratory operations. For example, during crisis relocation some of the branch laboratories may be better located with respect to the population-to-be-served than the main laboratory.

Recommendations that involve additional study are as follows:

- . Through the use of a questionnaire, survey all state public health laboratories and other selected state laboratories, e.g., veterinary diagnostic laboratories, to determine the current status of nuclear contingency and natural disaster planning.
- . Reactivate the planning effort to create a national epidemiological laboratory network. Given that so much of the national diagnostic microbiology resources are located in high-risk areas, the redundancy that a network would provide seems essential to insure a viable laboratory capability following a nuclear attack.

- . Develop a prototype state plan for providing diagnostic microbiology services during crisis relocation and postattack. A prototype plan would help state laboratory personnel in developing their own plans.

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## VI. MEDICO-LEGAL IMPLICATIONS OF EMERGENCY MEDICAL SERVICE AND CRISIS RELOCATION PLANNING INTERFACES

### A. Introduction and Overview

This chapter identifies legal issues that may affect the provision of health and medical services during crisis relocation. The legal implications involved in "emergency medical services" are given special attention, but health services of all types provided during an emergency period, not just services to deal with medical emergencies, are covered herein.

It is clear from the outset that numerous legal issues are involved with the management of medical problems in normal situations. This is the subject of an increasing accumulation of both litigation and legislation, as well as a considerable amount of legal literature. But there are numerous other legal issues that are peculiar to crisis relocation, including those connected with primary care as well as emergency medical services and cardio-pulmonary resuscitation application. This mix of legal issues is addressed in the following discussion.

As suggested in Section B, the myriad assortment of laws in each state and at the federal level, impinging in assorted ways upon medical care in crisis relocation, defies explicit description and analysis but nonetheless cannot be ignored or left to haphazard development.

Section C assumes that federally-employed health care providers (such as physicians and nurses in the military or Public Health Service) may be utilized in a population relocation situation. While there are some unresolved legal issues involved in their extensive utilization, this pool of persons may be considered as a resource without many of the legal restrictions which attach to civilian providers.

The two most problematic legal concerns inherent in the management of medical problems on a large-scale basis, including the crossing of jurisdictional and disciplinary boundaries, are liability for emergency medical care and liability for violation of professional licensing laws. These difficult matters are separately covered in Sections D and E. An associated practical legal problem is compliance with special reporting obligations (communicable diseases, child abuse, vital statistics, gunshot wounds, etc.) of each jurisdiction. Health providers are presumed to be familiar with these laws, but they vary from state to state, as shown in Section F. An especially sensitive matter is the removal vel non of patients from hospitals in a risk area. The legal issues involved are discussed in Section G.

The need for new state and federal legislation is supported by Section H.

The checklist in Section I is an outline of the legal issues associated with population relocation medical problems. It may be used to assess the legal environment in each jurisdiction or geographic area under study. It may also be used as a guide for developing new legislative proposals to clarify and delineate specific goals and desired outcomes.

The absence of legal literature on the medico-legal aspects of population relocation medical problems is described and illustrated in Appendix VI-A., a listing of the state license law coverage for health occupations is shown in Appendix VI-B, indicating the diversity of the state-by-state policies, and finally Appendix VI-C gives an illustrative list of supplementary tasks of military medical departments.

#### B. Legal Implications in Planning for Population Relocation

The management of medical problems associated with population relocation cannot be accomplished without legal implications. Whether planned for or



overlooked, there will be legal fallout from every significant management decision and medical action. Because health care delivery has become extensively regulated, particularly as to financing, conformance with direct regulatory programs and with existing reimbursement schemes is desirable. Since civil and criminal liability attach to unauthorized provision of care and to substandard performance, conformance with licensure laws and avoidance of malpractice is also desirable. To the extent that deviation from normal practices in the management of medical problems during a population relocation situation is not contemplated by legal arrangements made in advance, legal problems will necessarily ensue. While the law in the broad sense reflects the needs of society, it is not so flexible in its specific application as to replace the need for rational planning. The law of reimbursement, licensure, liability, and related areas is basically designed for the ordinary delivery of medical services. Neither statutory law nor common law is well suited for upheavals in the expected routine of medical and health care practice which might be brought about by a substantial population relocation during a military situation or a natural disaster.

The common law (the law made and followed by courts in the absence of statutes and regulations, or in interpreting them) is more flexible in application and sensitive to circumstance. But this court-made law is tied strongly to the past and relies on reasonable application of established principles to current problems. Thus, a judge is bound to the rule of consistency and may find barriers for satisfactorily resolving a legal problem not raised in an earlier court case. For example, the standard of care a civilian out-of-state physician should follow in a national military emergency is not firmly delineated because of the lack of court cases dealing with that situation.

On the other hand, the statutory law (and regulations promulgated by various federal, state and local agencies pursuant to statutes) is capable of being designed to anticipate future contingencies. Legislatures tend to make laws prospective in nature and, when well-drafted, somewhat self-executing. Statutes forecast new situations and provide guidance in dealing with them. In simplistic terms, common law leans on established principles decided in the past (and common sense, to the extent judges exercise their discretion); legislature-made law establishes principles for application in the future.

The purpose in this overly-narrow characterization of the two basic types of laws to be considered in this study is to explain one of the basic reasons there are complex legal implications in planning for medical management. Both types of law contain inherent difficulties for planners. Regardless of the extent of analysis of the common law, predictive legal advice is always speculative as well as being just one lawyer's opinion. The advice of a legal consultant about the application of the common law is reliable to the extent that he has been furnished accurate predictions of all the material circumstances in a future situation and to the extent he reflects the biases of the judges who will in the future decide the question. As in "The Rhyme of the Ancient Mariner," there are conflicting passages susceptible to varying interpretations, so too the common law contains many contrary principles seemingly unreconcilable. For example, a court might need to decide whether to relieve a non-physician from liability for performing an unsuccessful tracheotomy on a fellow citizen in distress during a disorganized patient relocation exercise. On the one hand the common law contains the principle that a person is liable to the victim of his clumsiness or foolhardiness. Yet it also contains the rescue doctrine, excusing Good Samaritans from ordinary liability for good faith efforts to help another citizen in distress.

Complicating this example is the presence in nearly every state of a statutory Good Samaritan law which spells out the legislature's policy about giving legal immunity to rescuers under conditions and limitations which differ widely from state to state. This is one especially relevant type of statute which illustrates the difficulty of reliance on statutory law for planners and for managers of population relocation medical problems. While Good Samaritan laws are discussed in detail later, they are mentioned here to demonstrate that even statutes specially designed for particular future emergency medical situations can fall short of resolving the legal questions that can arise about the application of those laws. Each state has drawn its Good Samaritan law distinctly different in scope and coverage, based on the particular set of future circumstances which the lawmakers envisioned at the time of the law's enactment. Apart from the differences among state laws, planners cannot be given certain advice by legal consultants about the future interpretation by a court faced with a future situation such as the unskilled tracheotomy mentioned earlier.

A further area of complication is the question of reimbursement for services provided during crisis relocation. The extant insurance policies, state insurance regulations and relevant federal laws require legal analysis. A few examples demonstrate the issues involved:

- . Typical Blue Cross-Blue Shield (BCBS) contracts with subscribers exclude payment for services that are "paid for directly or indirectly by local, state or Federal government agency," so it is unlikely that any of the medical care provided by a federal provider would be reimbursable by BCBS or, similarly, by other commercial insurers.

- . Typical BCBS contracts with subscribers exclude coverage for services "required for illness or injury sustained on or after the effective date of enrollment (1) as a result of an act of war within the U.S., its territories, or possessions or (2) during combat." Some health insurance policies also exclude services required as a result of "riots, civil disorders, war, or any act of war, or service in the Armed Forces." So the liability of BCBS and other commercial insurers for medical care for both the unremoved hospital patients remaining in the risk area and those receiving medical care in the host areas may be in question. On the other hand, the BCBS contracts with hospitals in North Carolina and Michigan which were examined contained no exclusions or references to a civil defense, disaster or emergency situation. Therefore, there may be no initial problem of BCBS liability directly to hospitals under those contracts.
- . Even if the question of liability were settled, the amounts of payments to hospitals and other providers rendering medical care in crisis situations would probably be in dispute. Simultaneous use of both volunteers and paid professionals may cause problems.
- . The Disaster Relief Act of 1970 provides funds to non-profit medical care facilities which are damaged by a disaster. The grants, which provide payment for up to 100 percent of the cost of restoration to predisaster conditions, are authorized by the President, and may be applicable to a population relocation situation.

In summary, planners are best advised by lawyers if the legal advice is utilized for the purpose of planning for contingencies with the expectation of possible legal implications rather than probable legal results. Planning



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should be done with knowledge of the existing state of the law--both common law principles and statutory provisions--and in conjunction with recognition of common law trends and new statutory proposals.

Since statutory law can be changed by policymakers, it can be made to more closely conform with future needs if those needs can be justified and politically translated. Nevertheless, it can never be designed to anticipate all complications. Thus, it should be accepted that the management of medical problems associated with population relocation cannot be accomplished without legal implications.

The purpose of this section of the study is to call attention to the state of the law and some of the opportunities for changing the law to lessen (though not eliminate) the legal fallout from management decisions and medical actions in future situations.

C. Legal Use of Federally-employed Health Care Providers

Actions taken by those health care practitioners who are in the federal service and functioning within the scope of their authority would not be expected to create state or local legal problems. For example, physicians in the armed forces are authorized by federal law to provide medical care to military personnel without regard to territorial boundaries. Military physicians are not required to be licensed in the state where their military base is located, at least when they perform official duties on the base and, when relevant, off base as well.

There is provision in the federal law for the temporary addition of medical personnel to the armed forces in the event of an "emergency." Supposedly, civilian health care personnel (at least physicians) could be brought into federal service for purposes of supplying medical care during crisis relocation. All the privileges and immunities that ordinary federal

physicians enjoy would also apply to these temporary personnel, depending on the promulgation of appropriate rules and procedures. For example, U. S. Code Title 10, Section 4022 provides:

In an emergency the Surgeon General, with the approval of the Secretary of the Army, may employ as many contract surgeons as may be necessary.

There is a similar provision for the Air Force, but not one for the Navy. Other federal laws are also important in defining the scope of action of a military medical officer. An illustrative list of supplementary tasks of military medical departments is shown in Appendix VI-C. The Controlled Substances Act (21 U. S. Code 801) authorizes rules and regulations regarding the prescription, dispensing, and administration of controlled drugs (formerly termed narcotics and other dangerous drugs). Under section 301.25(a) of the Code of Federal Regulations; Chapter 21 the requirement of registration in order to prescribe is waived for commissioned medical officers in the armed services. State licensure statutes often have provisions with a specific (though limited) exemption of federally-employed physicians from obtaining a license to practice in the state. The limitation is designed to prevent those physicians from providing services to the portion of the state's population which is not military or otherwise federally-connected. It is intended to restrict federal physicians to practice associated with their official responsibilities and to disallow private civilian practice.

Here is a relevant portion of one state's physician license law:

"Any person shall be regarded as practicing medicine or surgery within the meaning of this Article who shall diagnose or attempt to diagnose, treat or attempt to treat, operate or attempt to operate on, or prescribe for or administer to, or profess to treat any human ailment, physical or mental, or

any physical injury to or deformity of another person:

Provided, that the following cases shall not come within the definition above recited: . . .

(4) The practice of medicine and surgery by any surgeon or physician of the United States Army, Navy or Public Health Service in the discharge of his official duties."

There is great variety in the persons exempted and the manner in which the exemption is given from state to state. Montana exempts only "commissioned surgeons of the United States Army and Navy in the discharge of their official duties;" it appears that the Air Force should bring some pressure on the Montana legislature so that they can lawfully practice in Montana, although a court might well remedy the law by taking "judicial notice" of the Air Force. Confusion is also caused by the addition of the language "in the discharge of their official duties," which is present in most of the statutes. It is doubtful whether the Army physician who administers aid to a civilian accident victim off the military installation would be covered under this language. This question is particularly important in Montana, since it is one of the few states which does not exempt unlicensed physicians or other persons from the licensure requirements in an emergency. The answer is probably that the physician who so acted would be technically violating the licensure statute.

Another state with an unusual provision is Nevada, which exempts from the licensure requirements officers of the United States Indian Health Service, while on duty.

Military regulations often empower the military physician to act in an emergency. For example, the Air Force Manual provides the following:



"Emergency cases in consultation. A medical officer may engage in consultation with a civilian doctor. Also, if a civilian doctor is not present during an emergency, the medical officer may do whatever is necessary to save life or limb or prevent undue suffering."

Even in states without such specific exemptions the performance of official military medical duties would be exempted from state laws under the doctrine of supremacy. This doctrine insures that a legitimate federal purpose will not be frustrated by state or local legislative and judicial action. It is derived from Article IV of the U. S. Constitution, which makes the "Constitution, and the Laws of the United States which shall be made in pursuance thereof . . . the supreme Law of the Land." Additionally, court decisions have cited the well-established principle that activities of the federal government are not subject to state licensure requirements or inspection laws. See United States v. Murray, 61 F. Supp. 415 (E.D. Mo. 1945). Therefore, as for the question of the use of military medical personnel and Public Health Service officers in carrying out authorized duties for non-civilian patients under their jurisdiction in a population relocation situation, the legal issues are not different from those that routinely arise within the federal service.

An important consideration for federal medical liability is the Federal Tort Claims Act (28 U.S.C 1346(b) and 2674). If a federal officer injures a patient "while acting within the scope of his office or employment," the federal government may be held liable and, in addition, the officer may be free from liability under the doctrine of official immunity. "Official immunity," designed to protect policymakers and administrators, has been applied only in limited medical contexts involving psychiatrists being sued for libel in reporting a patient insane, false imprisonment for ordering hospitalization and malicious defamation for evaluating a serviceman's mental condition. The Tort Claims Act would not be applicable for the payment of

claims, however, if the officer is acting outside his government employment contract.

The official immunity doctrine is now irrelevant for medical personnel of the Department of Defense, Coast Guard and Central Intelligence Agency. New federal legislation (P.L. 94-64) insulates them from the expense of defending malpractice suits and paying judgments or settlements, if the alleged malpractice occurred while they were acting in the scope of their duties or employment. The question arises, then, whether rendering medical services to a civilian population during crisis relocation would be considered "within the scope of their duties or employment." Presumably, a properly prepared official order would cover the situation.

Some statutes and regulations have been found at the federal and state level to cover the exigency of utilizing federally-employed health care providers in a civilian context, as discussed above and listed in Appendix VI-C. But where those statutes do not apply, they would have no more authorization or protection than when they act outside the scope of their federal employment. Hence, there should be state or federal legislation specifically extending their authorization to provide medical services for the general civilian population under designated conditions, such as state or national emergencies. Without it, legal issues of licensure and liability arise, which are similar to those discussed for out-of-state civilian health care providers.

An excellent discussion of the legal liability of the U.S. Public Health Service personnel in providing medical care is found in Eli P. Bernzweig, Legal Aspects of PHS Medical Care, PHS Pub. No. 1468, U. S. Government Printing Office, 1966. Most of the discussion is also pertinent to military medical officers.

D. Liability for Emergency Medical Care: Good Samaritan Laws

Liability based on negligence or other aspects of tort law is one of the legal concerns when providing medical services in an emergency situation. Since not all medical care rendered in a population relocation would medically be considered emergency care (as demonstrated in other portions of this report), the legal principles governing emergency medical care would apply only to those circumstances which would constitute an emergency in normal times. Thus, the ordinary principles of the common law relating to emergencies and the relevant state statutes (commonly called "good samaritan laws") are applicable to this concern.

There is widespread misunderstanding of both the risk of good samaritan conduct and the application of good samaritan laws. A thorough discussion of this principle is necessary for determining its relevance to the medico-legal problems in population relocation situations. The conclusion reached is that good samaritan laws do little more than reinforce (and sometimes even frustrate) the principles of common law which have always provided adequate protection from liability for any physician or other health professional, and even a layman, who attempts to render appropriate medical care under emergency conditions. The wide variety of state laws, however, presents a confusing picture which does not always provide complete assurance to would-be rescuers that they are legally protected, particularly when they are in an unfamiliar state. Since virtually every state has good samaritan legislation, it is suggested that they be uniformly amended to cover the national (or state) emergency contemplated in the event of a population relocation situation. A model provision is presented at the end of this section.

1. Interrelationship of Law and Ethics

State legislatures have enacted good samaritan statutes for a



variety of legal, ethical, and moral reasons. It is a generally accepted legal principle that there is no legal duty to assist a stranger in a time of distress. (The only exception is that if one person caused distress to another, there is a legal duty to assist.) Neither physicians nor other health care personnel are legally bound to answer the call of strangers who are dying and might be saved. However, in our society it is a generally recognized moral duty to help a person in distress. Thus physicians and others have a moral and ethical duty to respond to requests for assistance in medical emergencies. The statement of medical ethics of the American Medical Association (AMA) includes a provision that recognizes this duty:

"A physician may choose whom he will serve. In an emergency, however, he should render service to the best of his ability. Having undertaken the care of a patient he may not neglect him; and unless he has been discharged, he may discontinue his services only after giving adequate notice. He should not solicit patients."

The ethical responsibility of the physician to come to the aid of an injured stranger with whom he comes in contact is quite clear. From the Hippocratic Oath to the most recent ethical code, it has always been a prime duty of the physician to minister to the injured regardless of whether the physician-patient relationship has been established.

What happens to the physician who breaches this clear ethical mandate? A particularly unfortunate case reported by Cheyet in Legal Implications of Emergency Care illustrates that the sanctions against the physician who refuses to play the role of the good samaritan are ineffective. According to a New York news story, a postman was struck in the leg by a bullet from a sniper's rifle. The postman managed to reach Dr. X's office, after being chased by a doorman of a nearby apartment house who accused him of dripping blood on his clean floor. Upon the postman's arrival at the doctor's office,



the receptionist telephoned Dr. X who was in a back room examining a patient. The doctor refused to see the postman and ordered his receptionist to refer the postman to another doctor some two miles away. The postman then asked the receptionist if she would call the police. She consulted with the doctor again, and again the doctor told her to do nothing. In a newspaper interview, the doctor made the following statement:

"It's true I sent him to another doctor. What could I do? The man comes in and says he was shot by a B.B. I'm examining a very sick patient. I can't take care of wounds. I haven't even got an instrument or even a band-aid. I practice internal medical. I told my receptionist to help him get to that doctor. As for the police, I told her not to call herself, but to permit him to call. I didn't want 15 cops trooping through my office. Believe me, there was not a thing I could do for him. I'm an internist. What would you have done?"

As a result of a complaint filed by the postman, the Kings County Medical Society suspended the doctor from membership for one month.

Mild though the professional sanction taken in this flagrant case was, it is more stringent than most in that usually no punitive action of any kind is taken when a doctor refuses to give aid to an accident victim. Again, no legal action could be taken by the postman for the failure of Dr. X to treat his wounds.

## 2. Groundless Fears of Liability

Why is the typical physician reluctant to render aid in emergency situations? The reason most frequently offered is that he fears that legal involvement will result. However, there have been no reported cases in which an injured stranger ministered to by a physician has sued the physician for malpractice. It is true that all trials are not reported and that claims could have been brought by such individuals against physicians and settled by insurance companies before ever reaching court. Cheyet reports a study by the AMA failed to disclose any such claims. The AMA also canvassed major

malpractice insurance companies in an effort to locate claims and has found none based on this type of emergency situation. The AMA also sent questionnaires to individual physicians. Available findings show that there are very few, if any, such cases. An unofficial preliminary analysis of 40,000 questionnaires showed that 10 physicians had had some kind of difficulty arising from the Good Samaritan situation. Of these, eight were disposed of without payment of any kind, and in two, payment of under \$500 was made because of what was termed the "nuisance value" of the claims.

Why then is there such an intense fear on the part of physicians to administer emergency aid if in fact there are no known incidents of legal liability? There is no question but that there is a tremendous fear, since so many physicians admit that they would not stop at accidents because of the possibility of such liability. In the survey Cheyet described, the AMA found that of those queried, about 50% stated they would stop to give aid in an emergency.

Part of the blame can rest with the mass media. They find a young physician, led by his high moral code into rendering aid to the victim of a highway accident, and then successfully sued by his recovered victim for a preposterous sum of money, makes for colorful magazine articles and television scripts. Several years ago, on a television series, Dr. Kildare was returning from a cocktail party late at night. He stopped at the scene of a highway accident to assist one of the victims who was, at that moment, giving birth. The infant died of suffocation due to a prolapsed cord, despite Dr. Kildare's best efforts. Sure enough, Dr. Kildare was sued; a verdict of \$66,000 was won by the plaintiff, and there was no allegation made at the trial that Dr. Kildare was negligent.

The Reader's Digest in the early sixties carried an article entitled "Why Doctors Are Bad Samaritans" which contained colorful and frightening assertions.

"The accident emergency is made to order for chislers and their lawyers . . . The burgeoning legalized blackmail of the phony malpractice suit can have serious repercussions for any of us who may be left writhing in agony in the mud when the passing physician's fear of bankruptcy overpowers his devotion to the Hippocratic Oath."

Cheyet claims that the mass media was at least partly responsible for generating a widespread fear of liability arising out of the emergency situation.

The AMA has stated, in commenting on the risk of playing the role of the good samaritan:

". . . the risk of legal liability for a physician who gives emergency medical care to a stranger away from his office or hospital is infinitesimal in comparison with the legal risks in other phases of medical practice. This should give physicians assurance that they can, without significant legal risk, live up to the principles of medical ethics, which state: 'A physician may choose whom he will serve. In an emergency, however, he should render service to the best of his ability.'"

Unfortunately, the words of Cheyet and the AMA have had little effect in diminishing the physician's fear of liability. The physician seems much more cognizant of what could happen than what has happened, and, as a result, the accident victim is often passed by. A physician in a disaster or population relocation situation might respond differently, but the fear of a later malpractice suit seems to be inherent in physicians as well as other health professionals, except perhaps rescue squad members.

### 3. Effect of Good Samaritan Legislation

Even though there is no duty to come to the aid of another person, the general principles of law state that anyone who does choose to aid another

in distress assumes a legal responsibility to exercise reasonable care and skill in rendering such aid. Thus, the fact that a good samaritan acts in good faith and for no payment is immaterial. It is the act of giving aid that creates a duty and subjects the good samaritan to liability if there is a lack of due care. However, one who is confronted with a medical emergency is not held to the same standard of care as normally is applied in a nonemergency situation.

The first good samaritan law was passed in 1959 in California to encourage on-the-spot emergency care and treatment by persons with the proper knowledge and skill. Since 1959, 48 states and the District of Columbia have enacted good samaritan statutes. The statutes vary markedly with regard to the persons protected, the standard of care required, and the circumstances provided protection.

Of the 49 jurisdictions which have enacted good samaritan statutes, 22 restrict immunity to licensed physicians and registered nurses, and 4 others grant immunity to physicians only. Nurses are covered in 45 jurisdictions. Of the states that grant immunity to physicians, 18 also extend immunity to physicians licensed in any state; 15 states that extend immunity to nurses include nurses licensed in any state. In 23 states, any person who renders aid or treatment at the scene of an emergency falls within the coverage of the statute.

Under most statutes, immunity is granted only in an emergency or for rendering emergency care. The concept of emergency usually refers to a combination of unforeseen circumstances requiring spontaneous action to avoid impending danger. Some states have tried to be more precise as to what constitutes an emergency or accident. According to the Alaska statute, the emergency circumstances must suggest that the giving of aid is the only



alternative to death or serious bodily injury. The Pennsylvania statute says an emergency is an unexpected occurrence involving injury or illness in public or private places.

Some statutes are so broadly worded that they could include emergencies that occur in an institution. However, because the purpose of the legislation is to encourage assistance where none is usually available, it is probably inapplicable in hospitals.

Massachusetts had one of the early good samaritan laws. Originally applying only to physicians and to the scene of motor vehicle accidents, it was amended to include nurses and any locale, as follows:

"No physician duly registered (in this state) and no nurse duly registered (in this state) or resident in another state, in the District of Columbia or in a province of Canada, and duly registered therein who, in good faith, as a volunteer and without fee, renders emergency care or treatment other than in the ordinary course of his practice, shall be liable in a suit for damages as a result of his acts or omissions, nor shall he be liable to a hospital for its expenses, if under such emergency conditions, he orders a person hospitalized or causes his admission."

#### 4. Limitations on Good Samaritan Laws

Cheyet and other commentators have pointed out the flaws in such statutes, including constitutional and other legal infirmities.

The Massachusetts Constitution provides that:

"Every subject of the Commonwealth ought to find a certain remedy, by having recourse to the laws, for all injuries which he may receive in his person, property or character . . ."

Most states have similar provisions. The legislature cannot, by passage of a statute, prevent a citizen of the state from having redress if he is injured because of the negligence of another. On the surface, it would seem that the legislature has removed such a remedy from persons who may be injured by the negligent action of a physician. It is possible that the good samaritan

statutes would be upheld as a permissible exercise of legislative power because of the serious nature of the problem which the statute seeks to remedy. It is important, however, that any persons relying on good samaritan laws realize that the existence of such a statute, while indeed significant, does not provide a foolproof grant of immunity.

In addition, such statutes do not prevent the rescuer from being sued for malpractice. The lawyer bringing suit needs merely allege that the attending physician did not act in good faith, one of the prerequisites for the immunity granted by the statute.

The term "good faith" is fraught with uncertainty. Does good faith mean that the physician can make the most careless or reckless error in judgment or treatment and still be immune to legal action as long as his intentions were well meaning? Or does good faith mean that slight mistakes, or even ordinary errors or negligence will be forgiven, but that gross errors will not? At present, there is no answer to these questions and there have been no cases which interpreted any of these statutes.

There is other language in the statutes which has given rise to difficult questions. Most of the statutes, like that of Massachusetts, require that the physician act gratuitously and without a fee. The merit of these provisions is extremely dubious. On the one hand, there is a kind of elemental fairness in the fact that if the physician is to receive a special grant of immunity from liability, he ought to forfeit remuneration for his actions. On the other hand, the maneuverability which this provision gives the physician is somewhat suspect. If the physician feels that he may have acted negligently, he must be careful not to send a bill. He can also delay in order to see if a claim is made or suit is brought by the victim. In addition, since the legislative policy behind the passage of the statute is to have physicians

stop and render aid at accidents, the requirement that no fee be collected seems to run contrary to this policy. Lastly, if a physician does spend a good deal of time and effort in the rendering of emergency care, there would seem to be no reason why he should not be reasonably paid for such time and effort if the victim can afford to pay. If the decision is made that a grant of immunity from liability is desirable, it does not seem proper that the right of the physician to collect for the value of his services should be taken away in exchange.

Each good samaritan statute provides a standard of care that delineates the scope of immunity for those persons eligible under the law. The standards vary widely from state to state and are often ambiguous. In most states, the scope of immunity is generally qualified by the statement that the person giving aid must act in good faith. Some statutes require that the physician or the person rendering the care must act with "due care," without "gross negligence," or without "willful or wanton" misconduct.

##### 5. Legal Purposes Served by Good Samaritan Laws

No cases have been found which interpret the language of good samaritan statutes or which have imposed liability on a physician or nurse for negligence in rendering assistance at the scene of an emergency. Likewise, there are no cases holding a physician or nurse liable for failing to render care at an emergency.

Thus, there is no need for the extraordinary protection which the good samaritan statutes purport to grant to persons who provide emergency medical care. There are, moreover, other convincing reasons why these laws are not necessary for the protection of rescuers, whether they have instate, out-of-state, or no licenses at all. Cheyet offers three arguments.



First, our system of justice has several built-in mechanisms which serve effectively to protect any person who acts in an emergency situation. The plaintiff-victim must first present a prima facie case, meaning that he must satisfy a certain minimum burden of proof before the case can go to the jury. If, on the basis of the facts stated by the plaintiff, the judge feels that a reasonable jury could not find for the plaintiff, he will not allow the jury to even deliberate. He will grant what is called a "directed verdict" for the physician, which terminates the case (unless the decision is appealed).

Secondly, the plaintiff, with few exceptions, must secure an expert witness who will testify that the defendant-rescuer acted negligently. That is, he must find a physician skilled in emergency medicine in a similar-type community as the place of rescue to testify concerning the impropriety of the rescuer's conduct. It is most difficult for the plaintiff to secure such testimony if he has an unjust claim. The only cases in which it is not necessary for the plaintiff to secure expert testimony is when the wrong is so obvious that the lay jury, without the aid of expert testimony, could pass judgment on the wrongfulness of the conduct.

Most important, however, is the fact that the standard by which any person, including nurses and physicians, is judged is not a rigid standard. A physician's conduct is judged by the manner in which the average physician in the same or similar community would have acted under similar conditions. The standard of negligence takes into account the fact that the physician may have been at the roadside with limited equipment, poor lighting, and no trained assistance. If a physician stops a life-threatening hemorrhage at the roadside without sterile equipment, and a subsequent infection develops, there is no case since it would be impossible for liability to result. However, if the physician tended a cut hand while ignoring an obstructed



airway, and the patient died as a result, the physician would, in all probability, be held liable. It seems that this is the way it should be, without a need to refer to such questions as "did he act in good faith" or "did he act without pay."

Despite problems of interpretation, it is clear that the purpose of the statutes is to encourage volunteer medical assistance in emergency situations. The language which grants immunity also supports the widespread popular belief that the doctor, nurse, or layman who is covered by the act will be protected from liability for ordinary negligence in rendering assistance in an emergency. In summary, this reinforcement of the principles of common law may be the only worthwhile purpose served by such statutes.

#### 6. Implications for Population Relocation

It is apparent that good samaritan laws are a questionable type of remedial or protective legislation in normal times. They are fraught with legal problems and imagined characteristics.

Are they more relevant for crisis situations?

None of them seem to contemplate the population relocation situation. They were initially designed primarily for auto accident scenes and only for physicians. The present form of many of them could be interpreted more broadly as covering diverse places and personnel. But they all seem to focus on an unplanned "emergency." Only to the extent that a state good samaritan statute is not so limited would it be applicable in mass crisis situations. Each state's statute would have to be examined in the light of any available court decisions (few are likely to exist) and state attorney general opinions (there may be several of these).

More important, however, is the general conclusion reached by most legal commentators on good samaritan legislation. It is redundant at best and only

serves to explicate (and publicize) the common law. If courts view it as being a substitute for common law principles, a good samaritan law may in fact narrow rather than expand the protection of rescuers. Nevertheless, the common law is widely accepted as furnishing adequate protection to rescuers, since liability will be imposed only when the rescuer's actions can be convincingly said to be unreasonable after considering the circumstances involved.

One other possible useful legal purpose served by good samaritan legislation may be the overriding of professional license laws for nonresident physicians and for other persons who are not physicians, as discussed in Section E. The provision of immunity from civil and criminal prosecution for "practicing medicine without a license" could be used by a defendant lay rescuer or a professional who has handled an emergency in another state where he is not licensed.

The principal social effect of such laws is to cause ordinary citizens to believe that they cannot sue a rescuer. The more extensive the publicity about good samaritan laws, the more likely it will have a protective result for persons assisting others in distress.

Thus, to be useful for population relocation situations, the good samaritan laws of every state should be amended to eliminate the numerous problems cited above and to anticipate the special needs that relate to that type of national or state emergency.

#### 7. Model Statute

A suggested model provision is presented here to point out the necessity for amendment of state statutes, if good samaritan legislation is to have any special application to population relocation situations:

Any person who renders health care services in this state during a national or state emergency shall not be liable

in any criminal or civil action for failing to have an appropriate license to practice in this state or for performing services outside the licensed scope of practice permitted by any license currently held. Such person shall be otherwise liable only for those actions which are unreasonable under the circumstances of the situation, taking into account the existence of the national or state emergency. A "national emergency" is defined as the period of time which the President has (or would have if he were able) declared as a "national emergency." A "state emergency" is the period of time which the Governor of that state has (or would have if he were able) declared as a "state emergency."

This model may be modified to accommodate state law, particularly as to the wording of current good samaritan legislation and any existing definition of "national emergency" or "state emergency."

E. Liability for Violation of Professional Licensing Laws

Most of the following discussion applies to physicians who may be unlicensed in the state where they are rendering either ordinary or emergency care or do not have a currently valid license from the state where they practice. The legal aspects of the discussion are largely applicable to other health professionals, as well. All states regulate the acts and activities which comprise the practice of medicine. This means that the provision of medical care in all settings by any person is controlled by state law. There is great variety from state to state in how such regulation is accomplished. Most states have a board (usually called Board of Medical Examiners) to administer the law and provide a criminal penalty for any person convicted of practicing medicine without a license. For example, Massachusetts law provides that a person can be punished by a fine of up to \$1,000 or imprisonment up to one year, or both. Michigan law provides a penalty of up to \$200 or imprisonment up to six months, or both. North Carolina has a penalty of \$50 to \$100 or imprisonment at the discretion of the judge, for each offense.

There are very few cases which are reported under the licensure statutes of the states, and an even smaller number which apply to out-of-state practitioners and to emergency situations. Nevertheless, a charge of practicing medicine without a valid license is a real possibility for any physician who responds to an emergency in a state other than one in which he is licensed, unless the licensure act of the state in which the emergency occurred excludes the rendering of emergency care from its provision or has some other protective proviso for out-of-state physicians. Similarly, a nurse, dentist, pharmacist, rescue squadman or laymen could be similarly convicted.

In addition to the possibility of facing a charge of practicing medicine without a license, the violation of the licensure statute also has severe ramifications if a negligence malpractice case were to be brought by a person who claimed that the care given him by the unlicensed person resulted in harm. There have been no cases arising out of the rendering of emergency care. However, violation of a statute, particularly a statute carrying criminal penalties, is often considered evidence of negligent conduct, and in a minority of states, violation of a statute alone is enough to actually constitute negligence. Thus, it is extremely important for a physician or any person giving health care services to be aware of the statutory provisions pertaining to licensure.

One of several problems that Cheyet has observed is that, while most states exempt the physician who acts in an emergency from the licensing requirement, they do so in ambiguous ways, failing almost universally to define what type of emergencies are covered or what situations may be considered emergencies to begin with.



The statutes which discuss emergency care and licensure usually take one of two approaches. Either they expressly exclude the physician who renders medical services in an emergency from the licensing law, or they deem by legislative fiat that such person is not practicing medicine. The first approach seems to be far more logical, since the physician who stops at an automobile accident is certainly involved in practicing medicine as the term is commonly used. It makes far more sense to recognize this and merely exempt him from the state's licensing act in such situations. Nevertheless, either approach will effectively protect the physician who does act in the emergency situations.

Another problem Cheyet notes is that if a physician licensed in a state other than New Jersey was passing through New Jersey and stopped to give aid to an injured accident victim, he would only be excused for practicing medicine without a license until a licensed physician arrived on the scene. At that point, he could take no further action regarding his patient. He certainly could not be charged with abandoning his patient because a patient is not abandoned if he is delivered over to the hands of other qualified medical personnel. However, there are difficult ethical questions involving the duty of a physician to complete treatment which he has begun. Apart from licensure considerations, the physician-patient relationship has definitely been established, and it seems improper to require the first physician to cease all activity as soon as the second physician arrives. The situation could be compounded if, for example, the chief of surgery at an out-of-state hospital were to stop to give aid on a New Jersey highway and the first licensed New Jersey physician on the scene were an intern on his first accident call. The law should facilitate the giving of the best care possible

to an injured person, and, in the case of a physician, there should be no such limitation which prohibits him from acting even following the arrival of a licensed physician. The provision is a good one if a layman is first at the scene, but not if a physician is the first to respond.

There is a qualification in the New Jersey law which does soften the impact of this provision; the person first at the scene can continue his work if he functions "under the direction of" the licensed physician. Thus, the first physician might be said to be working "under the direction of" the second physician, but this arrangement may give rise to other more complicated problems.

Vermont has a similar provision in its licensure law, but it does not even exempt the person functioning under the direction of the licensed physician. The statute provides that the licensing chapter does not apply to "any person or persons giving aid, assistance, or relief in an emergency or accident cases pending the arrival of a regularly licensed physician or surgeon."

Louisiana exempts from its licensure statute only those persons who are attending a woman in childbirth. No other emergency situation is covered. Perhaps it was deemed by the legislature that other emergencies can wait for a physician, but that childbirth presents a problem of much more immediacy. This seems to be a rather narrow limitation which would impede the action of a physician licensed in another state or a Louisiana physician whose license, for one reason or another, was not in effect.

Iowa has also placed severe restrictions on the class of persons who can act in an emergency without violating the licensing statute. The law provides that among those exempted are "students of medicine or surgery who have completed at least two years of study in a medical school" approved by the

medical examiners, and who prescribe medicine under the supervision of a licensed physician and surgeon, or who render gratuitous service to persons in case of emergency. This is the only exemption given for emergency care. Thus, the out-of-state physician traveling through Iowa would not be exempted from the licensing provisions, and would be ill-advised to give assistance. It is possible that one could claim that physician was a fortiori a student of medicine or surgery who has completed at least two years of study in a medical school (the statute does not specify that it has to be an Iowa student or an Iowa medical school), so it is conceivable that an out-of-state physician could come under the exemption. The rest of the language in the paragraph makes such an interpretation extremely unlikely, however, and Iowa would do well to broaden its exemption.

Wisconsin, in both its good samaritan legislation and its emergency licensure exemption, defines an emergency situation in such a manner as to exclude the confines of a hospital or other institution which has hospital facilities, or a physician's office.

The language of the Virginia statute poses an interesting problem. It provides:

"Nothing in this chapter shall be construed to prohibit or require the furnishing of first aid or medical assistance in case of a genuine emergency in the absence of a qualified practitioner."

In addition to the question of what is a "genuine emergency," an even more important problem is what is meant by the words "qualified practitioner?" If these words mean a practitioner who is licensed to practice in Virginia, then the statute is the same as Vermont, and the out-of-state physician, as well as the nurse or layman, would be displaced as soon as the licensed physician arrived. If, on the other hand, "qualified practitioner" means one who is qualified to practice medicine, then one would be faced with a real problem as

to who would be displaced by whom at the scene of the accident. The graduated medical student or the physician licensed in another state could both be considered "qualified to practice medicine."

Such language is difficult to interpret and is illustrative of poor legislative drafting.

Many states require that the emergency care rendered be gratuitous. This requirement is similar to that contained in the good samaritan statutes. The states which exempt physicians licensed in other states and others who are permitted to render aid only if they do not charge for their services are Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Maryland, Missouri, Nevada, and New Mexico. For example, New Mexico law states:

"Provided that nothing in this act (medical licensure provisions) shall be construed to prohibit gratuitous services in cases of emergency or the domestic administration of family remedies . . ."

It is clear that if a physician did charge for his services in rendering emergency care, he might well be held to have waived his exemption and thus would be open to a charge of practicing medicine without a license.

Again, the purpose behind the exemption is to encourage physicians licensed in other states and other persons to render aid in an emergency even though they are not licensed to practice medicine in the state in which the emergency arises. The requirement that no fee be charged works against this purpose and is probably based on a rather antiquated notion that a physician who is given some kind of immunity cannot also realize monetary benefits.

#### F. Special Reporting Obligations for Health Care Providers

In a population relocation situation or otherwise, any person providing health care services should know that state and local health statutes and regulations require certain information to be transmitted to governmental



officials. Although most statutory reporting requirements do not contain an express immunity from suit for unauthorized disclosure, as a general rule the person making the report under statutory command will be protected by the doctrine of privilege. The reporting statutes are the legal means by which the states regulate the health, welfare, and safety of their citizens through the exercise of the state's general police power. Out-of-state providers of care are likely to be subject to these reporting requirements when functioning in a host area.

1. Child Abuse and Neglect

What constitutes an abused child is difficult to determine because it is often impossible to ascertain whether a child was injured intentionally or accidentally. Even the legal definition of a child varies. In one state a 12-year old is an adult in the eyes of the law; in another state an 18-year old is legally still a child. To compound the confusion, some state laws apply to minors, but do not specify what a minor is, and others use the word "child" without further definition.

All states and the District of Columbia have enacted laws to protect abused or neglected children. Furthermore, almost all states specify the persons required to report cases of child abuse or neglect.

The various laws differ in their definition of an abused child. Generally, an abused child is one who has had serious physical injury inflicted by other than accidental means. The injuries may have been inflicted by a parent or any other person responsible for the child's care. Some states extend the definition to include a child suffering from starvation. Other states include moral neglect in the definition of abuse. For example, Arizona mentions immoral associations; Idaho includes endangering the child's morals; and Mississippi describes being found in a disreputable

place or association with vagrant, vicious, or immoral persons. Sexual abuse is also enumerated as an element of neglect in the statutes of a few states.

Most state laws require certain people to report suspected cases of abuse. In a few states, although not required to report instances of child abuse, certain identified individuals who do so are protected. The child abuse laws may or may not provide penalties for failure to report. The classification of individuals covered by the various statutes ranges from physicians to "any person."

All abused-child statutes provide protection from civil suit for anyone making or participating in a good faith report. Most states also provide immunity from criminal liability. Even in states that do not, it is extremely unlikely that anyone making a good faith report of suspected child abuse would be subject to criminal liability.

Reporting laws specify the nature and content of the report of child abuse. Almost all the statutes require that when a person covered by statute is attending a child as a staff member of a hospital or similar institution, and child abuse is suspected, the staff member must notify the person in charge of the institution, who in turn makes the necessary report. Typical statutes provide that an oral report be made immediately, followed as soon as possible by a written report. Most states require that the report contain the following information: the name and address of the child, the persons responsible for the child's care, the child's age, the nature and extent of the child's injuries (including any evidence of previous injuries), and any other information that might be helpful in establishing the cause of the injuries and the identity of the perpetrator.

## 2. Newborns

Most states require anyone in attendance at birth to report, either

to the physician in charge or to an appropriate health officer, all instances of diarrhea, staphylococcal disease, or other infections. Most states provide for penalizing any violator of these laws.

In particular, health personnel must report inflammation, swelling, redness, or unnatural discharge from an infant's eyes (ophthalmia neonatorum).

Phenylketonuria (PKU) is one of the most recent additions to the list of reportable conditions. Actually, the chief concern is to encourage the testing and treatment of infants for PKU. However, some statutes, such as Nevada's, still require a report to an appropriate health agency if tests reveal PKU in an infant.

### 3. Communicable Diseases

Many states have enacted laws which require that actual or suspected cases of communicable disease be reported to the proper authorities. Although other persons are affected, the responsibility for reporting generally falls upon a physician or a public health nurse. For example, a New York regulation provides:

"SANITARY CODE, Ch. 2, REG 3 (1954). Reporting by others than physicians of cases of diseases presumably communicable.

When no physician is in attendance it shall be the duty of the head of a private household or the person in charge of any institution, school, motel, boarding house, camp or vessel or any public health nurse or any other person having actual knowledge of an individual affected with any disease presumably communicable, to report immediately the name and address of such person to the local health officer. Until official action on such case has been taken, strict isolation shall be maintained."

### 4. Violent Wounds

Gunshot or violent wound laws require reports where injuries are inflicted by lethal weapons or, in some cases, by unlawful acts. Some

statutes even include automobile accidents within their definition of lethal weapons. The New York statute is typical:

"§265.25 CERTAIN WOUNDS TO BE REPORTED (Penal Law)

Every case of a bullet wound, gunshot wound, powder burn or any other injury arising from or caused by the discharge of a gun or firearm, and every case of a wound which is likely to or may result in death and is actually or apparently inflicted by a knife, icepick or other sharp or pointed instrument, shall be reported at once to the police authorities of the city, town or village where the person reporting is located by: (a) the physician attending or treating the case; or (b) the manager, superintendent or other person in charge, whenever such case is treated in a hospital, sanitarium or other institution. . . ."

5. Criminal Acts

Besides the subjects specified by statute as reportable, the health care provider may have a moral or legal duty to report to the police such acts as attempted suicide, assault, rape, or the unlawful dispensing or taking of narcotic drugs. Much of this information may be learned while caring for patients and would ordinarily be privileged communication. Therefore, care must be taken that only the police are given such information.

G. Admission and Discharge of Patients

A population relocation situation will necessitate the reduction of services in facilities in risk areas and the transfer of patients to facilities in host areas. A number of legal problems arise when patients are inappropriately discharged or transferred and when a facility refuses to treat or admit new patients. The general legal principles which apply in normal situations can be expected to affect the outcome of disputes or complications arising during crisis relocation and therefore should be used in planning for decisionmaking.

1. Admissions

Hospitals and other health care institutions have found themselves



in legal difficulty for mishandling the acceptance, transfer or rejection of patients who present themselves at the hospital door.

Usually no legal problems concerning the right to admission arise when a hospital accepts a person through formal arrangements made beforehand by the person's physician, if that physician has admitting privileges at that hospital. On the other hand, when an individual appears at the emergency service of the hospital, or when a physician with admitting privileges requests that a patient be admitted and the hospital does not desire to treat the patient, some legal difficulties may emerge. This problem may arise with host area facilities.

There has been a reluctance on the part of courts to depart from the traditional view that no person has a positive right to be admitted to a hospital. Generally, this has been so with respect to charitable and governmental, as well as proprietary hospitals. While discrimination in admission practices on the basis of race, color, creed or national origin constitutes a violation of laws forbidding discrimination, such provisions merely forbid the use of these criteria but do not create a positive right to be admitted. There, even though a citizen may have a statutory right to admission and treatment, admission is still subject to availability of space. However, an analysis of judicial decisions reveals a marked tendency of courts, while maintaining the traditional view, to find other bases for imposing a duty upon the hospitals to admit persons for care under various circumstances. These legal bases upon which a right to admission may be asserted and the statutes which relate to admission are subject to variance among the host areas.

A 1961 Delaware case was the genesis of a significant but not universal trend in other states to impose a duty on all hospitals which maintain

emergency rooms to provide adequate emergency services to all who seek them. However, all courts have not established a clear mandate that hospitals must admit all patients seeking emergency care.

Denial of admission to a hospital because of misdiagnosis of a serious condition by the emergency department personnel is a problem for both host and risk area hospitals. Cases involving ruptured appendix, head injuries and myocardial infarctions indicate that courts will uphold jury awards against hospitals when there was evidence that inadequate diagnostic tests were performed or physicians were not involved in making the diagnosis. Also, when a patient is given emergency treatment and sent home without instructions (e.g., a "head sheet" for head injuries) to return if certain symptoms appear, a hospital is exposing itself unnecessarily to charges of negligent care and followup.

## 2. Discharges

The two major problems that arise with respect to discharging persons from hospitals relate to the exercise of restraint upon patients who desire to leave and the discharge of patients whose health or safety may be endangered by leaving the hospital. Both of these situations may arise during crisis relocation.

In some states, statutes creating and regulating governmental hospitals include provisions that deal with procedures for the discharge of patients. Statutory provisions in several states apply to nongovernmental hospitals. Discharge provisions are ordinarily general in nature and define the right to discharge a patient as an act of discretion by the managing hospital authorities, based upon the medical condition of the patient or upon the authorities' suitable reasons. Most discharge statutes merely provide that rules may be promulgated for discharging patients. The legal principles

regarding discharge have generally been derived from court decisions and do not seem to vary because of the nature of the hospital's ownership.

A patient of sound mind should not be prevented from leaving the hospital. Action to prevent a patient from leaving would constitute a false imprisonment for which the hospital would be liable.

When a hospital (either in a host or risk area) undertakes to treat a person, it must not act unreasonably in removing him or in having him removed from the premises. The law requires that a patient be kept in the hospital and that treatment be continued if it is foreseeable that his condition would be aggravated or the risks of danger increased by removal. It is not necessary under general law for a hospital to retain a patient until he is cured. A patient may be transferred to another hospital as long as the risk of harm to the patient resulting from the transfer is not unreasonable. If a new patient is presented to a risk area hospital, moreover, there may be a duty to transfer the patient to another hospital after emergency treatment, if the first hospital does not have the proper facilities and equipment for the continued care of the patient.

As a general rule, a patient should only be discharged from a hospital upon the written order of a physician who is familiar with the physical condition of the patient. Discharge of a patient, apparently unable to reach home safely because of age or disability, or discharge in the custody of a person unlikely to be able to safeguard the patient properly, could constitute negligence if such patient met with injury upon leaving the hospital. The appropriate standard of care may require that the hospital provide or arrange for a suitable escort for such a patient. After a discharge order has been given by the physician, the hospital no longer need permit the patient to remain, except to ensure that such necessary assistance is provided. If the

patient refuses to leave the premises, his status is that of a trespasser, and reasonable force may then be used to secure his removal. A North Carolina statute declares it criminal trespass for a patient to stay after being discharged from the hospital, and permits law enforcement officials to remove the trespasser.

There are times, such as during crisis relocation, when a patient might be released temporarily in the custody of a willing relative or friend. The decision to release the patient temporarily is basically a medical decision, but it may have legal implications. The hospital is charged with the duty to retain the patient or to transfer the patient to a hospital in a host area, when it is foreseeable that the person's condition will be aggravated by a temporary absence. If a patient is to be released temporarily, the hospital should follow procedures designed to minimize risks to the patient during his absence, such as providing full instruction for self-care.

#### H. New State and Federal Legislation

In analyzing existing state and federal health laws as they relate to the population relocation situation, it is clear that there are numerous, unwieldy legal problems. Some of these problems can be avoided by the enactment of carefully designed legislation. Others, particularly those related to reimbursement for medical services, can be resolved by administrative action.

State legislation is strictly a matter for individual state action. However, two mechanisms have been successfully utilized to promote uniform and expedient state action.

The first is the development of model legislation. There are various groups which have been active in developing and promulgating model laws, notably the Council of State Governments and the Commission on Uniform State



Laws. Interstate compacts, including an existing one on civil defense, are a form of model legislation.

The second is the use of federal funding programs to induce state governments to adopt programs outlined by the federal legislation. One of a multitude of recent examples is the National Health Planning and Resource Development Act of 1974 (P.L. 93-641). Under that act and subsequent regulations issued by the Department of Health, Education, and Welfare each state must have an approved "certificate of need" program by 1980 in order to continue to receive federal funding of numerous public health and mental health projects. When a legitimate "national end" is involved, conditions can be attached to federal grants which amount to near coercion.

A different approach is the enactment of direct federal legislation to avoid or resolve anticipated problems due to medical actions taken during population relocation. Such legislation would be based on the Constitutional grant of power to the Congress to directly regulate foreign and interstate commerce. Numerous federal health laws have been enacted under this power relating to the regulation of food, drugs, and cosmetics, inspection of meat products, control of biological products, and labeling of hazardous substances. These matters have been entrusted to federal agencies and enforced by federal officers with offenses tried by federal courts.

There seems to be no substantial doubt that the Congress could enact legislation to address most of the problems discussed herein.

An excellent discussion of health legislation and regulations as it pertains to the respective roles of federal and state government responsibilities is contained in Frank P. Grad, Public Health Law Manual, American Public Health Association, 3rd printing, 1973.

Cheyet in Legal Implications of Emergency Care, after analyzing the various pieces of state legislation relating to civil defense and disasters (including the Interstate Civil Defense Compact, signed by about half the states), concluded: "...it would appear that in most states the physician has two choices: he must either make a lawyer a part of the triage team, or he must completely ignore the disaster legislation as presently constituted. The latter course is highly recommended, although it is hoped that better statutes in this area will soon be forthcoming." (p. 126)

I. Checklist of Potential Legal Problems and Issues Involved with Management of Medical Problems in Population Relocation

The following checklist outlines the matters to be addressed in considering the legal issues raised in planning for medical care during crisis relocation. It may be used as a tool in analyzing any particular state or geographic area, which may be either a host area or a risk area, in order to arrive at an assessment of the medico-legal environment within which population relocation must be accomplished. It is also a guide for developing legislation or legal interpretations which are designed to foster a more favorable legal climate, or at least more predictable legal outcomes. The items addressed in the checklist pertain both to any state-by-state approach to legal modifications being proposed or to a new national legislative program to resolve medico-legal problems which may arise in, or follow from, crisis relocation.

Not incidentally the checklist reveals the complicated agenda of legal issues that are involved with the study topic and indicates the necessity for further attention to be given them beyond the scope of the present study.

## CHECKLIST

### A. Health Care Personnel

#### 1. Host State Problems for Out-of-State Providers

##### a. License Laws

- (1) What are the reciprocity provisions? Is there a mechanism for limited permits or temporary exceptions?
- (2) Can out-of-state providers be used as "consultants?"
- (3) Are there specific restrictions on the use of certain persons or procedures? Are licensed or certified out-of-state providers such as nurse practitioners, physician assistants, emergency medical technicians (EMTs) given any legal status?
- (4) What is the definition of "emergency" for purposes of exemption? Are there attorney general opinions recorded on this matter?
- (5) What does the absence of relevant provisions mean?

##### b. Liability

- (1) What is the prevailing legal formula for determining the standard of care for the host state? Is it the traditional "same" or the newer "same or similar" community rule? (The "same or similar" rule is much more supportive of out-of-state providers).
- (2) Do the statutes or case law spell out the legal authorization or consent requirements for adult, minor, incompetent and incapacitated patients? Is it the "community rule" or the "reasonable man test?"

(Out-of-state providers would be bound to follow the local practice).

- (3) Is there statutory guidance on confidentiality, beyond the common law principles of invasion of privacy, breach of contract, and defamation? (Unfamiliarity with the local law is no defense to a breach of confidentiality.)
- (4) Are there professional liability insurance requirements for providers to practice in the state or particular institution? Is there a state malpractice insurance fund? Do the out-of-state providers have geographically limited coverage under their own policies?
- (5) Is there a good samaritan law? Who does it cover? (Some cover only persons licensed in the host state.)

c. Statutory Obligations

- (1) What diseases and conditions are reportable (communicable diseases, cancer, child abuse and neglect, newborn conditions, violent wounds, abortions, etc.)? To whom and by whom?
- (2) What are the procedures for reporting vital statistics? Who can sign birth and death certificates?

d. Hospital Privileges

Do hospitals in the host state have procedures for granting temporary privileges to visiting medical staff? Are there restrictions against certain persons (foreign-trained physicians; osteopaths; podiatrists; dentists; nurse practitioners; physician assistants, etc.)?



e. Drug Laws

- (1) What are the restrictions on prescribing, dispensing and administering prescription drugs?
- (2) Can nurses and physician assistants prescribe?

2. Host State Problems for In-State-Health Personnel

a. License Laws

- (1) What is the scope of practice permitted for each category of health provider?
- (2) What limitations are imposed on the performance of medical acts by nurses, physician assistants and EMTs?
- (3) Can EMTs perform emergency medical services to the extent of their training? Are there special statutory provisions for EMTs?
- (4) Are there provisions for trained personnel who do not hold current licenses (e.g., retired nurses and physicians)?
- (5) What is the extent of exceptions from the license act stricture for "emergencies" and "domestic remedies"? Are there court cases or attorney general opinions which explain these forms?
- (6) Are there special provisions which permit cardiopulmonary resuscitation to be performed by any person trained to do so?
- (7) Is there authority for licensing boards or the Governor to waive or suspend license requirements in a state or national emergency?

b. Liability

- (1) What is the legal formula for determining the "standard of

care" to be observed by non-physicians when performing medical functions (i.e., is a nurse, a physician assistant, or an EMT held to the same standard as a physician)?

- (2) What are the requirements for the legal authorization or consent of patients who are adults, minors, incompetent, or incapacitated? Are they different in an emergency? Are there special statutory provisions for emergency care of minors?
- (3) What are the rules for confidentiality in providing medical care? Are they different in an emergency?
- (4) Do standard liability insurance policies contain any restrictions or exceptions for state or national emergencies (e.g., act of war)?
- (5) What special legal immunities in the statutes apply to health care providers (good samaritan laws, reporting laws, etc.)?

c. Statutory Obligations (same as for out-of-state health personnel, plus the following):

- (1) What duties do medical examiners and coroners have with regard to deaths of non-residents? Can they delegate their duties to others in emergencies?
- (2) Are there restrictions on workers compensation in a state or national emergency?
- (3) Are there state laws or regulations restricting overtime work by state or local government health care employees?

- (4) Can the Governor or other government official waive restrictive statutes during a state or national emergency?

d. Drug Laws

- (1) Who besides physicians has statutory authority to prescribe, dispense, and administer drugs--nurses and physician assistants, in some circumstances?
- (2) Can dentists prescribe for medical conditions?
- (3) Can veterinarians prescribe for human patients in an emergency?
- (4) Can pharmacists diagnose and treat in emergencies?
- (5) Are there special state requirements relating to blood and blood products which might hinder use in a state or national emergency?

e. Reimbursement

- (1) Does third party insurance coverage for hospital and medical care contain restrictions on reimbursement during a state or national emergency? Is there a standard "act of war" exclusion cause?
- (2) Is there any provision in state law for Medicaid requirements to be simplified during temporary periods of emergency conditions? In federal law for Medicare?

f. Contracts

- (1) Do union contracts for health care employees contain restrictions which may hinder the full utilization of personnel in hospitals, etc., during a state or national emergency? Can overtime and job description restrictions be waived in certain circumstances?

- (2) Do contracts between public health departments and private providers permit additional services to be provided to or through health department facilities?

## B. Health Facilities and Equipment

### I. Facilities in Host Area

#### a. License Laws

- (1) Do license laws prohibit the use of facilities (nursing homes, veterinary hospitals, clinics) from any unlicensed use, such as temporary conversion to acute medical care for a relocated population?
- (2) Are there restrictions on capacity for hospitals, nursing homes, etc.? Can they be waived?
- (3) Can unlicensed facilities (high school gyms, civic auditoriums, warehouses, etc.) be utilized during emergencies for treatment of patients?

#### b. Liability

- (1) Would a hospital be liable to damaged patients under the corporate negligence doctrine for allowing its facilities to be utilized by unlicensed practitioners (e.g., out-of-state physicians) or by incompetent persons (retired physicians or nurses) during crisis relocation?
- (2) Can a hospital refuse admission of non-emergency patients seeking to be transferred in from hospitals in a risk area?
- (3) What liability exposure arises when unstable or unfit patients desire to be transferred out after the termination of crisis relocation. Or when stable and fit



patients refuse to be transferred back to hospitals in risk areas?

c. Reimbursement

- (1) What restrictions exist on reimbursement for services rendered during crisis relocation: exclusions in BCBS and commercial health insurance policies ("acts of war;" federally provided care; volunteer services)? Limitations in Medicare/Medicaid regulations? Inapplicability of federal disaster relief programs?
- (2) What level of reimbursement can be expected if it is available: costs based on actual expenses during crisis relocation? Normal costs? Normal charges?

2. Facilities in risk area

a. Liability

- (1) Does liability exposure to remaining patients for negligence increase with the reduction of available services?
- (2) What legal risks are involved in transferring or discharging patients against medical advice or against the wishes of patients?
- (3) What legal risks are involved in refusing to treat or admit new patients during crisis relocation? Or for refusing to accept transfers during period immediately following crisis relocation?

b. Employees

What legal complications arise in the management of remaining employees: are union contracts suspended, etc.?

c. Reimbursement

Are there restrictions on reimbursement for services rendered during crisis relocation?

3. Equipment

1. Are there licensure restrictions on the use of out-of-state equipment (ambulances, portable laboratory equipment, etc.) in the host state?

2. Are there waiver provisions in applicable regulations?

C. Interstate Relations

Do any existing interstate compacts, or other agreements or arrangements between states, or emergency powers of Governors to act alone or with other Governors, affect any of the matters outlined in Sections A and B?

APPENDIX VI-A

LEGAL LITERATURE ON POPULATION RELOCATION MEDICAL PROBLEMS

## APPENDIX VI-A

### LEGAL LITERATURE ON POPULATION RELOCATION MEDICAL PROBLEMS

There is scant legal literature which applies to the consideration of the management of medical problems in population relocation. No books or articles were identified which apply directly and few pieces were located which were helpful in analyzing the legal implications of this problem. There is some legal literature on the general problems surrounding licensure, although little on the question of the relevance of license statutes to out-of-state practitioners and unlicensed persons in emergencies. There is a considerable number of articles about good samaritan law, most of it critical of legislative attempts to deal with the legal issues involved in rescue or emergency medical care situations. Very little legal information is available on the question of reimbursement.

Perhaps the closest work to being useful is Neil L. Cheyet's book Legal Implications of Emergency Care, published in 1969 by Appleton-Century Crofts, New York. It is aimed at physicians and focuses on emergency situations but contains some discussion useful in preparing this chapter. A portion of his short chapter on "Medical Care in a Disaster" follows:

"One might well wonder at the need for a consideration of the legal implications of the physician's action in time of a national or local disaster. It is possible that even in time of great calamity, with perhaps thousands of casualties, the physician must pause to think of the risk of legal liability? The answer is unfortunately in the affirmative, due primarily to careless statutory drafting and a lack of understanding of the problems on the part of those responsible for disaster care planning and legislation.

"The national picture concerning the physician's liability in a disaster is extremely confusing. It is of course more essential to view this problem in its national scope than any other aspect of emergency care because of the fact that state lines and jurisdictional limitations would decrease greatly in significance in the event of a national



disaster. In spite of the need for joint action among jurisdictions, there is an amazing lack of continuity among state laws dealing with the subject of disaster. It is hoped that this chapter will provide some impetus for a standardization of the state laws which deal with the disaster situation.

"The Office of Emergency Planning of the Federal Government is presently preparing a new national plan. Questions such as legal liability of physicians and others who may volunteer their services, as well as licensure considerations which may affect professional personnel who may find themselves in other jurisdictions during a disaster, should be dealt with in this new plan. The 1964 national plan makes no mention of these significant questions. A model statute is badly needed, as current statutes and attempts at promulgation of an effective interstate compact system have not been successful."

Two other works are tangentially useful; one dealing with the legal aspects of the U. S. Public Health Service, the other addressing the entire range of legal problems in state and local public health programs. They are: Eli P. Bernzweig, Legal Aspects of PHS Medical Care, PHS Pub. No. 1468, DHEW, 1966 and Frank P. Grad, Public Health Law Manual, American Public Health Association, 3rd. printing, 1975.

Finally, a few articles in the recent legal literature which may have some bearing on the problems discussed herein are shown in the Selected Bibliography below.

One conclusion that can be reached from a survey of the legal literature is that this is a matter which has not yet been brought to the attention of the legal community and which therefore invites (and perhaps demands) further attention. Failure to pursue additional analysis of the many legal problems involved and to act on appropriate recommendations will force after-the-fact legal involvement, with unpredictable results.

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**APPENDIX VI-B**

**HEALTH OCCUPATIONS LICENSED BY STATE**



Table VI-B-1. Health Occupations Licensed by State

STATE	Acupuncturist	Health Dept. Administrator	Hospital Administrator	Nursing Home Administrator	Chiropractor	Clinical Lab Director	Clinical Lab Technician	Dentist	Dental Hygienist	Emergency Medical Personnel	Inhalation Therapists	Midwife	Practical Nurses	Professional Nurses	Occupational Therapist	Optician	Optometrist	Pharmacist	Physical Therapist	Physical Therapist Assistant	Physician (M.D.)	Physician (D.O.)	Physician's Assistant	Podiatrist	Psychologists	Radiology Technician	Sanitarian	Social Worker	Speech Pathologist/Audiologist	Veterinarian	Animal Health Technician
Alabama																															
Alaska																															
Arizona																															
Arkansas																															
California																															
Colorado																															
Connecticut																															
Delaware																															
Florida																															
Georgia																															
Hawaii																															
Idaho																															
Illinois																															
Indiana																															
Iowa																															
Kansas																															
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Louisiana																															
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Mississippi																															
Missouri																															
Montana																															
Nebraska																															
Nevada																															
New Hampshire																															
New Jersey																															
New Mexico																															
New York																															



APPENDIX VI-C

ILLUSTRATIVE LIST OF SUPPLEMENTARY TASKS OF

MILITARY MEDICAL DEPARTMENTS

APPENDIX VI-C

ILLUSTRATIVE LIST OF SUPPLEMENTARY TASKS  
OF  
MILITARY MEDICAL DEPARTMENTS

- |  |   |
|--|---|
| 1. Assistance in civilian emergencies, i.e., natural or manmade  | Appendix 50, U.S.C. 221   |
| 2. Assistance to Civil Defense   | Executive Order 19052   |
| 3. Support to foreign nations in natural disasters, e.g., earthquakes, etc.  | Statutory authority given the President as Commander-in-Chief of the Armed forces |
| 4. Support to the U. S. Soldiers Home and Airmen's Home  | Act of Congress 1851  |
| 5. Support to certain Federal agencies, i.e., Federal Bureau of Investigation, Secret Service, etc.  | Economy Act of June 30, 1932, 47 Statute, 417 as amended, 31 U.S.C. Sec. 686      |
| 6. Support of the Federal Employee Health Service Program  | Title 5, U.S.C. Sec. 150  |
| 7. Compliance with the Occupational Safety and Health Administration program   | Occupational Safety and Health Act of 1970  |
| 8. Provide health care to designees of the Secretaries of the Military Departments, members of Congress, Cabinet members, Justices of the Supreme Court, etc.  | Title 5, U.S.C., See 301, and Annual Appropriations Act                           |
| 9. Support the operation of the Panama Canal Company Health Bureau   | Executive Order 1885, June 1914   |
| 10. Support tri-Service activities, i.e., Armed Forces Epidemiological Board, Military Blood Program, Defense Medical Materiel Board, the Armed Services Medical Regulating Office, Armed Forces Radiobiology Research Institute, Armed Forces Institute of Pathology, Armed Forces Pest Control Board, and OCHAMPUS | Executive Orders and DOD and departmental directives                              |



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DETACHABLE SUMMARY

FINAL REPORT RTI/1532/00-04F

September 1978

Study of Crisis Administration of Hospital Patients; and  
Study of Management of Medical Problems Resulting  
from Population Relocation

by

D. R. Johnston, M. N. Laney, R. L. Chessin, and D. G. Warren

for

DEFENSE CIVIL PREPAREDNESS AGENCY

Washington, D.C. 20301

under

Contract No. DCPA01-77-C-0241  
Work Unit 2431H

*Approved for Public Release; Distribution Unlimited*

## SUMMARY

This report describes the results of a research project performed under Defense Civil Preparedness Agency (DCPA) Contract No. DCPA01-77-C-0241. The project consisted of five separate tasks related to crisis administration of hospital patients and to management of medical problems resulting from population relocation. The tasks investigated were as follows:

- . Problems associated with the consolidation of risk-area hospital patients and resources,
- . Impact of evacuation of war theater casualties on intra-U.S. facilities,
- . Capabilities of allied medical facilities and their application in crisis relocation,
- . Capability of the Center for Disease Control and state counterpart laboratories to function in disaster and crisis environments, and
- . Medico-legal implications of emergency medical service and crisis relocation planning interfaces.

An earlier study proposed the consolidation of nonrelocatable (to host areas) patients into one or a few risk area hospitals as a means of reducing the number of health services workers in risk areas during crisis relocation, while continuing to provide care for such patients. This research examined that proposal in greater detail by determining the types and percentages of patients with conditions requiring that they not be moved to host areas, by determining the likelihood of one facility having the necessary resources to care for such patients, and by proposing consolidation alternatives suitable for a variety of community situations.

The types and percentages of nonrelocatable patients that may be expected at any given time in a "typical" short-stay medical-surgical hospital were determined. As would be expected, patients with neoplasms and circulatory, digestive and respiratory conditions, and accident victims account for much



of the group of patients to be consolidated. About 9.5 percent of hospital patients will fall into the nonrelocatable category and will, therefore, be candidates for consolidation during crisis relocation.

The likelihood of one facility having the necessary resources for consolidation was studied for six risk areas. It appears that nonrelocatable patients could be consolidated into one hospital each in the Colorado Springs, Colorado; Macon, Georgia; and Raleigh, North Carolina, risk areas. Due to the distances between facilities, it will probably be necessary to use two hospitals for consolidation in the Utica-Rome, New York, risk area. In the San Antonio, Texas, and Washington, D.C., risk areas, two and three to four consolidation facilities will be needed, respectively. The results of this study indicate that the number of hospitals remaining open during crisis relocation can be reduced dramatically through consolidation of nonrelocatable patients.

Consolidation alternatives include:

- . Consolidation of nonrelocatable patients into one (or a few) hospitals providing all required services;
- . Consolidation of nonrelocatable patients into a reduced number of hospitals on the basis of type of condition;
- . Consolidation of nonrelocatable patients into the facility providing the greatest protection, other things being equal;
- . Consolidation of hospital services (e.g., food, laundry, and laboratory), if more than one risk area facility must remain open; and
- . Combinations of the alternatives listed above.

Current Department of Defense (DoD) thinking provides for the treatment of war theater casualties in civilian hospitals in the United States in the event that U.S. forces are engaged in a conventional war overseas. In view of DCPA's plans to evacuate risk areas and the possibility that nonrelocatable hospital patients would be consolidated during crisis relocation, it was of



interest to assess the likely impact of an influx of war theater casualties on the medical problems resulting from civil population relocation if crisis relocation were to take place while the U.S. was engaged in conventional war outside of the United States.

Assuming that war theater casualties would be treated the same as civilian patients during crisis relocation, relocatable casualties would be moved to host areas along with civilian patients, while nonrelocatable casualties would be consolidated into one or a few risk area hospitals with their civilian counterparts. The impact of war theater casualties on medical problems resulting from civil population relocation is expected to involve:

- . An increased number of nonrelocatable patients in risk areas,
- . An increased number of health services workers required to remain in risk areas to care for the increased patient load, and
- . An increased number of patients relocated to host areas.

Thus, the most likely impact is one of increased numbers of patients, both in risk and host areas.

In order to cope with the increased numbers of patients, plans should provide for:

- . An increased number of nonrelocatable patients to be consolidated in risk area facilities,
- . An increased number of patients to be relocated to host areas,
- . The specialized services required by the nature of battle casualties in the amount needed in the risk area facilities; these services should be considered in selecting a hospital(s) for patient consolidation,
- . Alternate receiving hospitals in host areas to take casualties incoming after crisis relocation has begun, and
- . Additional transport to move convalescing war theater casualties from risk area to host area hospitals.

It is unlikely that hospitals in most host areas will be adequate to meet the primary care needs of a greatly enlarged population during crisis

relocation. Recognizing that problem, this research examined the capabilities of selected allied medical facilities with a view to their use as supplemental primary care facilities during crisis relocation. The allied medical facilities considered were chiropractors', dentists', and osteopaths' offices; nursing homes; and veterinary clinics and hospitals.

Since dentists and osteopaths are primary care providers, it is reasonable to expect that they will continue to serve as such during crisis relocation, the only real change in their activities being in the volume of patients that they see. Accordingly, their offices will not be available as supplemental primary care facilities. Similarly, it is expected that chiropractors will continue to provide primary care. Indeed, with individuals unaccustomed to strenuous physical labor engaged in the development of expedient shelter, a number of strained backs requiring the assistance of a chiropractor may be expected. As with the dentists' and osteopaths' offices, chiropractors' offices are not expected to be available as a supplemental primary care facility. On the other hand, nursing homes may offer the possibility of providing supplemental inpatient care. Depending on the particular nursing home and the types of patients therein, it may be possible to make some beds available to serve as a supplement to a hospital by discharging patients to the care of friends and family. By foregoing or, at least, restricting the treatment of animals, veterinary clinics and hospitals can be used as outpatient facilities for the treatment of human patients. In addition, the mobile dispensaries used by veterinarians engaged in large animal practices would seem applicable as mobile outpatient care units.

Guidance to assist the crisis relocation planner in planning for the use of allied medical facilities was prepared, as was an Allied Medical Facility

Appendix to the Health and Medical Annex to the Fremont County, Colorado,  
Prototype Crisis Relocation Plan.

Ascertaining the capability of the Center for Disease Control (CDC) and state counterpart laboratories to function in disaster and crisis environments, including nuclear and natural disasters, was also an objective of this research.

From a purely technical standpoint, CDC and nearly all of the state counterpart laboratories have the capability to provide diagnostic microbiology services for the communicable diseases thought to be potentially significant following a nuclear attack or a natural disaster and during crisis relocation.

In the event of a nuclear attack, direct weapons effects may render many of the laboratories inoperable. Thus, four of CDC's six facilities, including the principal facility in Atlanta, are in areas judged as being at a high risk of direct weapons effects. Of the 50 state public health laboratories, 32 are located in high-risk areas for direct weapons effects, nine are in areas designated high-risk because both direct weapons effects and radioactive fallout are anticipated, and nine are in low-risk areas.

CDC and the public health laboratories of the states of Colorado, Georgia, New Mexico, and North Carolina (the states visited) routinely provide diagnostic microbiology services in support of communicable disease control following natural disasters. It appears that they are also capable of providing such services during crisis relocation, up until such time as an attack occurs.

At CDC and the four state laboratories, plans for nuclear attack contingencies, where they exist, have not been updated recently and, in general, are not very detailed. Further, the laboratory directors interviewed



were not aware of crisis relocation. CDC has designated an alternate operations site in a low-risk area (Lawrenceville, Georgia); the four state laboratories have not.

Recommendations for upgrading current CDC programs in order to assure their capability of controlling communicable diseases in the event of nuclear war are to:

- . Prepare a detailed plan for the use of the Lawrenceville facility.
- . Identify alternate operations sites in low-risk areas for the Anchorage, Chamblee, and Phoenix (locations of CDC laboratories) activities. Prepare plans for the use of the selected alternate sites.
- . Prepare a plan for postattack communicable disease surveillance.

Assuming that the situation at the four laboratories visited is representative of state public health laboratories in general, the following recommendations are made:

- . The 41 state laboratories located in high-risk areas should select alternate operations sites in low-risk areas and prepare plans for staffing and equipping them during crisis relocation.
- . All state laboratories should review their states' crisis relocation plan to determine if the relocated population necessitates changes in laboratory operations.

The final objective of this research was to identify legal issues that could arise in providing health services during crisis relocation. In the context of this research, emergency medical service means all types of medical services provided during an emergency period and thus includes primary care and public health as well as treatment of medical emergencies.

Laws bearing on this problem area vary considerably from state to state. The medico-legal implications of emergency medical service and crisis relocation planning interfaces are largely unpredictable, since there are few legal precedents on which predictions could be based. For example, the liability position of physicians and other health care providers is unclear



with respect to licensure restrictions, good samaritan acts, and other aspects of providing care during an emergency period. It does appear, however, that federally employed health care providers would be immune from state laws during crisis relocation if they are acting under proper authorization. There is a need for both federal and state legislation addressing some of the problems that can be anticipated now.

A checklist of legal questions to be considered in planning for the management of medical problems during crisis relocation was prepared. The checklist covers license laws, liability, statutory obligations, hospital privileges, and drug laws for in- and out-of-state providers. It also includes questions concerning facility licensing, liability and reimbursement.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report describes research on crisis administration of hospital patients and management of medical problems resulting from population relocation. About 9.5 percent of risk-area hospital patients are nonrelocatable, i.e., they are either too ill or too severely injured to be moved to a host area. It appears feasible to consolidate nonrelocatable patients into one, or a very few, risk-area hospitals.		

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## 20. Abstract (Continued)

Alternative plans for consolidation of nonrelocatable patients were evaluated. Evacuation of conventional war casualties from abroad to intra-U.S. hospitals during crisis relocation is expected to increase the numbers of nonrelocatable patients in risk areas, increase the patient load in host areas, and increase the requirement for health services workers to remain in risk areas. Crisis relocation plans should be modified to accommodate war theater casualties. Nursing homes, veterinary clinics and hospitals, and chiropractic, osteopathic and dental facilities (offices) were examined with a view to using them as additional primary care facilities during crisis relocation. Nursing homes, through judicious discharge of residents, can serve as hospitals and veterinary facilities can serve as outpatient clinics. Guidance and a prototype plan were prepared. The Center for Disease Control (CDC) and all state public health laboratories can provide services in support of communicable disease control following a natural disaster and during crisis relocation. Their capability to provide services postattack is questionable. Recommendations for upgrading public health laboratory programs were made. Lacking precedents, the medico-legal implications of emergency medical service and crisis relocation planning interfaces are largely unpredictable. Federal and state legislation addressing problems that can be anticipated now is needed. A checklist of medico-legal questions was prepared.

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Defense Civil Preparedness Agency Contract No. DCPA01-77-C-0241  
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D. R. Johnston, M. W. Laney, R. L. Chessin and D. G. Warren  
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Defense Civil Preparedness Agency Contract No. DCPA01-77-C-0241  
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